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THE HIGH SCHOOL IN OUR SYSTEM OF EDUCATION.

BY JOHN O. NORRIS, B.S.,
Master of the East Boston (Mass.) High School.

Should the High School have any place in our system of free public schools?

At the bidding of Dennis Kearney and his associates, the great State of California answers, No. Many men of property, and local politicians without property, have answered in the negative. Some men, who boast of being self-made, and thus relieve the Creator of a great responsibility, return a negative answer. The kind-hearted philanthropist, firmly convinced that educating other people's children out of their environment is a great calamity, answers in the negative, and immediately proceeds to write an article for the Sunday paper on the crime of over-education.

In addition to these men, there are others that really wish to answer in the negative, but do not feel quite sure that such an answer will be popular, and, consequently, like most trimmers, they *doubt*. They doubt the policy of extending the State system so far. They believe in popular education, and stoutly maintain that it is the palladium of liberty, etc., but they doubt the wisdom and expediency of carrying it beyond what is necessary in daily life. Newspapers also speak of common schools in language which shows that the writers do not include the high school as a part of the common school system.

These facts, familiar to us all, show that this is a question that must be met. As teachers we must meet it. It is of no use to say, "This question was settled in colonial times, or in the Constitution,

or in the School-law of 1826, or in the days of Horace Mann, the renaissance of education." Nothing is settled in a State like ours, unless it rests on the confidence of the people; and so long as indifference concerning an institution exists, so long as active opposition to it lives, so long must that institution be a subject for discussion, and so long must its friends endeavor to remove the indifference, and silence the opposition, or show that it rests on a weak or dangerous foundation.

Can it be shown that the State has made a mistake, that it should limit the studies of its free schools to those commonly known as grammar-school studies? If this can be done, we should accept and support this conclusion.

It must not be forgotten, however, that this system dates from early colonial days. In 1647, less than twenty years from the date of their first charter, the people of Massachusetts, by the General Court, passed a law beginning as follows:

> 'It being one chief project of Satan to keep men from the knowledge of the Scripture, as in former times keeping them in unknown tongues, so in these latter times, by persuading from the use of tongues, that so at least the true sense and meaning of the original might be clouded and corrupted with false glosses of deceivers; to the end that learning may not be buried in the graves of our forefathers in Church and Common Wealth, the Lord assisting our endeavors. It is therefore ordered by this Court and the authority thereof," etc.

Then followed two sections. The *first* provided for a school, to give instruction in reading and writing, in every town numbering fifty householders. The second section ordered, "that where any town shall increase to the number of one hundred families, they shall set up a grammar-school, the master thereof being able to instruct youth so far as they may be fitted for the University." To insure the object of this section, it was enacted, "If any town neglect the performance hereof above one year, then every such town shall pay five pounds per annum to the next such school, till they shall perform this order;" and this penalty was afterward increased to ten, and later to twenty pounds.

The histories of the old towns of the State show that this law was enforced. Our State Constitution merely repeats the ideas of this act as follows: "It shall be the duty of legislatures to cherish the interests of literature, etc., especially the University at Cambridge, public schools, and grammar schools in the towns."

Here, then, is an institution that has lived almost two and a half centuries. This fact is a strong presumption in its favor, and throws

on those who attack it the burden of proof. They ought to show conclusively that it is not a benefit to the State, and does not supply the need felt in former days. This has not been done, but a variety of assertions, opinions, and propositions have been advanced, some of which it may be well to consider.

[From one of the best known educational publications in New England.]

TWELVE PROPOSITIONS ON THE RELATIONS OF THE STATE TO HIGHER EDUCATION, BY DR. ROBINS, OF CANADA.

1. The good of the Commonwealth alone justifies the interference of the State with education.

2. It is for the good of the Commonwealth that such an education, as every boy and girl of twelve or fourteen years of age should have, be within the reach of every child within the State.

3. Two classes within the State must now be distinguished,—those who toil, and those who direct the toilers.

4. Those who direct the toilers are either those who possess extraordinary natural ability, or those who have inherited an assured possession.

5. It is not for the good of the Commonwealth that the school-life of the masses should be much prolonged, for while nature is yet plastic they must acquire the manual dexterity and the habits of patient, persevering labor, which are essential to their happiness and their success.

6. It is for the good of the Commonwealth that the leaders of society should have a more liberal, more thorough culture, and so a much more prolonged course of education. This is what is meant by "higher education."

7. In such an education only the few can participate,—want of talent, want of time, want of means forbid it.

8. Every child has an equal right to share in the advantages of the common education provided by the State, but it is not just that the State should make public provision to secure for a class advantages that cannot be shared by all.

9. The child of the rich has a just claim that the State shall expend on his education as much as on that of the child of the poor man, but no more.

10. Whatsoever, therefore, the education of the child of the rich man, whether from its superior character or from its longer duration, costs more than the education of the poor man, must in justice be borne by the rich man himself.

11. But when the child of the poor man gives evidence of character and intellect so superior that he will hereafter be a leader of men, it is for the good of the Commonwealth to see that he shall have, at the public cost if necessary, an education that shall soften his manners and ennoble his mind.

12. It is the interest of the State, then, to establish and maintain in centers of population a system of superior schools, subsidized by the State funds to the same extent as the elementary schools, but mainly supported by fees, open to all who pay the cost, and at the cost of the State to such as give evidence of extraordinary talent.

These propositions assume that the higher education is mainly for a class, the rich. Some time ago a writer in the *Boston Daily Advertiser* spoke of our high schools as follows: "The great mass cannot afford to send their children at all, though they pay for the support of the schools." I have heard the assertion flatly made that the high school was supported by the State for the advantage of people who ought to pay for the education of their children. Is this true?

Some years ago the Superintendent of Schools in Worcester took up this charge, as far as one high school was concerned, and proved it false. I have added to his figures those for the high schools of Melrose, Medford, Stoneham, and East Boston. The number of pupils is over 1,000, and the towns and cities offer a fair average for the high schools of the State. About twenty-five per cent. of the pupils are the children of parents that only pay a poll-tax, or none at all; sixty-four per cent. are children of parents taxed for $3,000 or less; between seventy-four and seventy-five per cent. have parents that are taxed for less than $5,000; and but thirteen and a half per cent. of the parents pay a tax on more than $10,000. Does this prove that the high school is the school of the rich? Is it not rather the school of the poor, or at least of those who are worth but little besides the house that shelters them? The assertion, then, that in the high school the money of the poor man is paying for the education of the rich is defective in this one respect,—it isn't true.

In opposition to this false assertion, the truer one that the property of the rich is taxed to educate the poor man's child in the high school, is sometimes given as a reason against it. Even so high an authority as Professor Sumner takes the ground that the man of property that sends no chilldren to the high school should not be compelled to contribute to its support. This conclusion is based on the ground that the high school is not an advantage to the State; for if it is admitted to *be* an advantage, it must stand on the same footing as other State institutions; if it can be shown to be of *no* advantage, the argument that it bears unequally on people is not needed; and, admitting that it bears *une-*

qually, does *not* prove it to be of no advantage; consequently, this argument, if it proves anything, proves too much.

What it asserts in regard to high schools is true of all other schools. If the State were to accept it as a principle, all corporations would be freed from the payment of a school-tax, as would all persons having no children in public schools, and the public schools would die of starvation. The principle might extend to other public expenses, and blind men might ask to be exempted from taxation for lighting streets; and, possibly, some mean-spirited individual might object to being taxed to maintain lunatic asylums or houses of correction, because none of his family were inmates.

The self-made man objects to the high school. Not Henry Wilson, not Abraham Lincoln, nor the hundreds like them, whose careers have been alike honorable to themselves and glorious to their country; for such men have always been ardent supporters of the fullest and broadest education for the whole people. Unfortunately there are two other classes of self-made men; first, those that have become rich but have remained ignorant, whose standard may be called the Plutonian standard. Mr. Anthracite Ironsides, for example, begins his career as a blacksmith's apprentice. He works hard, saves his money, never takes a holiday, dickers in watches with the young men of the town, and is soon spoken of by the knowing as a very *smart* young man. He starts in business for himself, and in a few years is at the head of a large forging establishment. He is a successful man, and is becoming a capitalist. He combines with others in a company to purchase and work iron and coal mines. His youthful shrewdness has crystallized into an unscrupulous and unrelenting selfishness that sets aside all principles of equity, and this enables him to obtain control of a majority of the company's stock. Mr. Ironsides is a coal and iron magnate. His horizon is bounded by coal and iron, and his firmament is tinted with the green and gold of greenbacks and eagles. His argument against higher education is himself. He points to his portly figure in the mirror, and says, "Mr. Ironsides, I congratulate you. You are a truly successful man. Where are your youthful companions, who were in the high school and the college when you were in the blacksmith's shop? Which of them can point to such evidences of practical success as these? Most of them are school-masters, ministers, architects, or engineers, with now and then a 'literary feller,'—good fellows, but no capital. I could buy the whole lot with what I made on that last rise in iron."

Thus soliloquizes Mr. Anthracite Ironsides, and concludes that

higher education is of no advantage, that the State should not indulge in such an expensive and useless folly. He does not for a moment consider that such success as his is exceptional,—the lot of but *one* in thousands. He does not realize that the exercise of his natural abilities, aided and improved by education, would have brought a far higher quality of success. He has not learned what the *Spectator* had found out nearly two hundred years ago. In the Golden Scales, "notwithstanding the weight of natural parts was much heavier than that of teaching, I observed that it weighed a hundred times heavier than it did before, when I put learning in the same scale with it."

The third class of self-made men have overcome neither poverty nor ignorance, but have a *gift*, which, in their own estimation, entitles them to a hearing; this gift our grandmother used to call the "gift of gab." The motto of these men seems to be "*Vox et præterea nihil*,"—it *ought* to be "*Vox clamantis in deserto*." These men need no attention, except the passing remark that, to thoughtful people, their clamor against the high school is a convincing argument in its favor. Joining hands with these vociferous demagogues in a crusade against the higher education, stand men that one would not expect to find there; men of culture,—not all, not the majority, but too many. Their objection rests on the ground that only those that are to be the leaders in affairs need the higher education. This is the attitude of some of our College professors, of some social reformers, of some men that move in the upper circles of society.

Not long ago, the great Independent Journal of New England, in an elaborate editorial, presented the views of this class so pointedly, that it may be well to consider them for a short time. I will quote some passages which give the idea of the whole article, and I only wish I had time to give the whole:

"Is it wise or best to educate our children beyond the position which the vast majority of them must always occupy? Is not the one great crime in our educational system the fallacy, that education is to confer in some blind way an unexpected opportunity upon one and lift him into exceptional positions? . . . . It is safe to ask what was done before people reached the insane idea that every child was to be educated beyond the studies of the common school, if the parents desired? . . . . What is the use of a good part of our secondary education when it hampers the instincts to self-help, which ought to be as common to-day as they ever were? . . . . What is the use, if your boy is not exceptionally bright, to attempt to fit him for college or business on any large plan? . . . . Are not the ideas of our children altogether beyond the possibilities of life?"

Speaking of the drift of "representative schools" in Boston and Quincy, the writer says:

"None of the boys, none of the girls expected to really work for a living. They were aiming at something beyond and above their social rank and condition. . . . . It is a hard pass that we have come to in our purpose to give the youth of our time increased educational privileges. We have educated them out of their circumstances, beyond and above their plain duties, in a way to unfit them for honest labor, and without the preparations in character for the higher grades of service."

The whole article is full of this idea of over-education. It deliberately charges that our educational system is filling children with ideas, making them unwilling to labor; and, in short, is preparing them for a life of discontent and misery.

Some time after, another editorial appeared in the same journal on the same subject. This article begins by quoting from another prominent journal the following remark:

"It is noticeable that the Independent Journal goes to the very root of the matter, and asserts that we are doing the rising generation an irreparable wrong. It is asserted that the inevitable result of what is called higher education of the pupils is to unfit them for the duties they ought to perform without enabling them to attain the positions they are educated to seek. Discussion and theory aside, has experience as yet shown that the Independent Journal has ground for its opinions?"

This shows us how this editorial was understood, and what the Independent Journal was called upon to do. Its reply was as follows:

"The question is rightly asked, and there is no trouble in answering it. But before it is answered, it is worth while to look at our education as a whole, from the social point of view. The American principle is, that every one shall have a chance to make the most of himself. The parent has felt this as the spur to his own early manhood, and his children are brought up in this atmosphere. This, as a general principle, is not to be discouraged. In communities where there is no aristocracy of blood there must be the aristocracy of merit. This is the American title to superiority. The free school system is established expressly to carry out this idea in American society and life."

And yet, according to the first editorial, by carrying out this idea for which it was "expressly established," the system is doing the rising generation an "irreparable wrong." I wish the Independent

Journal would tell us by which of these statements it means to stand. If by the second, we have no use for the first. The second stands on the true ground, and has well said that this is the American idea. It is the idea of progress everywhere, and to abandon it would mean to turn our backs on one of the most desirable motives to human effort and advancement,—a wholesome discontent with one's present. Let us see, now, how experience proves the statements in the first editorial. I quote from the second again:

"And yet the education is not satisfactory, because the schools do not turn out pupils with a training that helps to grapple with the difficulties of practical life. It may be said that too much is expected when the average capacity is duly considered, but the reply is that unless pupils of average capacity are helped by their education in earning their bread, unless their school training makes them more effective, intelligent, and conscientious citizens than they would be otherwise, the chief object of education has not been attained; it is the failure of our educational system at this vital point that is awakening attention and alarming society."

This is the evidence of experience,—whose experience, the writer does not say. He merely states that this is what experience testifies, and expects the community to take his word for it. I feel very much like asking the question which the skeptical boy asked the schoolmaster about the letter *A*: "How do you know it 's *A*?" "Why, my teacher told me." "How did he know?" "His teacher told him, I suppose." "How do you know but what he lied?" calmly asked the boy.

As I understand this, if it means anything, it means that our system of education has not helped pupils of "average capacity" to be more effective, intelligent, and conscientious than they would be otherwise. Those familiar with the subject, and competent to judge, tell us that the system at present is superior to that of the past. Have not a majority of the present generation been trained by this system of education? Did not most of the men and women who are "grappling with the difficulties of practical life" receive their training in our common schools ten, twenty, thirty or forty years ago? Do they not act as effectively, as intelligently, and as conscientiously as those trained by any system yet invented?

We must judge of the future by the past; and if the system of the past has produced a population noted throughout the country for intelligence and moral worth, what reason is there for the assertion that the better system of the present is not obtaining like results?

But there is more evidence by which experience proves over-education; our writer goes on:

"But it is time to go into particulars. One is the crowding of too much into the course of study . . . . Boston schools are so loaded down with a little of everything, that the average children are not able to reach the end of the course of study in the grammar-schools before they are required to go out to labor, and consequently they are sent forth imperfectly instructed in the things they most ought to know. . . . . What is true of Boston schools is probably true of other schools. . . . . And, partly growing out of the crowding, the course of a study is a difficulty for which the teachers are not wholly responsible. It is the want of personal education. Our present system, under these two heads, inflicts upon the community some of the worst evils that exist under heaven."

I am afraid this is becoming confusing; but I had an impression that the writer was attempting to prove that what is called higher education was "unfitting pupils for the duties they ought to perform," because it educated them "above and beyond their plain duties," and his proof now seems to be that average boys and girls have to go to work before they have received this education, and consequently they are injured by it. That is, the higher education is ruining our children because they don't get it. How asserting that average children are sent out of school "imperfectly instructed in what they most ought to know," substantiates the charge of over-education is a mystery.

The conclusion of the article is remarkable. I will quote two or three sentences:

"In every direction you find persons whose education has been of the quality that has unfitted them for the work God intended them to do. They cannot do the work of the few; they are trained just above the work of the many; and they are unwilling to accept what they can do best. An education that leads to this result is a crime against society, and a crime against the individual."

The average man would like some statistics as to the number of such persons, as to their previous history, and on various other interesting points before coming to a sweeping conclusion; but this writer evidently is a seer; he is hampered by no restraints; with a genuine modesty and lack of self-consciousness that proves true inspiration, he is prepared to announce just what the Almighty intended a man for, and to settle at sight all questions of environment. Great as is this boon to so many waiting mortals, to others it must be a harbin-

ger of disappointment. To one of those comfortable persons who imagines himself pretty well suited to his occupation, and who hugs the fond delusion that everything is to go on smoothly in the future, how startling it must be to hear that judicial voice in measured and monotonous tones pronounce the sentence,—"God did not intend you for that position; you are one of the many,—why try to be one of the few? You are *a misfit;*" and thus ruthlessly are demolished his satisfactions in the present and his anticipations for the future.

There are strong objections to this idea that a few children should be selected for the higher education, and that it should be refused to the mass. I can only mention a few. I will not go into the discussion of the embarrassments and mistakes that would arise in trying to make a selection, though a strong argument against the plan might be made on that ground. The first objection is this: In a group of children, nobody can tell who are destined to become leaders. To do this would require a greater seer than the one we have spoken of.

In this matter, I agree with the Boston policeman who was stationed at the entrance to a new English steamer, in order to superintend the admission of visitors. There was great curiosity to see the vessel, and a large and somewhat noisy crowd was awaiting the signal to enter. The steamer's officers were in dismay, and, turning to the officer, said: "We can't have all these people on board. You may let gentlemen come on, but no others." "I shall be glad to do so," replied the officer, "if one of you will stand here and pick out gentlemen. I can't take the responsibility of notifying anybody that he isn't a gentleman."

Who dares to take the responsibility to stand by the door of the high school, and say, "You were not destined to be a leader in this world; you must not come in." Whenever this shall be done, the voice of the people will be heard saying, "This is our school, and it must have no tests for admission that any reasonably intelligent child cannot pass.

Another objection to this theory of education lies in its opposition to all our ideas and practices. Toilers and leaders are separated by no boundary-line, carefully drawn, but so graduate themselves from one to the other that, in a majority of instances, it would be incorrect to say of a leading man, "He has never been a toiler."

There is one other objection to this idea that has great weight with me, and I am quite sure it will with my readers. I often ask myself this question: "What would have been the effect in your own case had this view of education prevailed? Is it probable that you would

have been considered promising enough to receive the training of a leader?" And, in candor, I am obliged to answer, "*That* is extremely doubtful; all the probabilities, in fact, are against it." And this answer is emphasized by the remembrance of some rather sneering remarks by some friends of the family, apropos to a college education, like the following, "There's so-and-so, who has been to college, tending a toll-gate;" the inference being obvious. Had my father been influenced by this (and every day of my life I thank God that he was not), I have little doubt that I should still be working at the shoemaker's bench, like many who were my schoolmates; and had this doctrine of exclusion been applied to you, my readers I venture to affirm that many of you would now be carrying on a little country farm, or working at a trade.

There is one trouble about the theory of exclusion; viz., men apply it to other people's children, but not to their own; and the other people are apt to think that they themselves can judge for their own children; and thus, fortunately, the exclusion theory makes less headway than it otherwise would. Space will not permit us to dwell longer on this part of the subject.

THE PLACE OF THE HIGH SCHOOL IN OUR SYSTEM OF EDUCATION.

Let us next consider the proper place of the high school in our system,—I mean with reference to the other parts of the system, the primary and grammar schools. If this system is to be a unit, there should be no decided break anywhere in it; the high school should stand in as close relations to the grammar school as that does to the primary school. The transition from the primary to the grammar school is natural and easy; so it is from one class in the grammar school to the next above; but at the end of the grammar-school course this is not so. Here there seems to be a way-station, a change of cars, and quite often many travelers conclude to give up the journey at this point, while those that go on really consider that they are starting on a new journey. In the city of Boston, not over half of those that complete the grammar-school course go on to the high school. The majority of those that do not continue, feel too old to attend school longer, or wish to be earning money; only a comparatively small number are obliged to remain at home on account of poverty. I presume other high schools suffer in the same respects.

This seems to be due to two causes: First, is the idea that the grammar-school course gives a good education, and that, having finished that, one is fully prepared for all the practical duties of life. This leads many to the conclusion that the high-school studies are

mainly ornamental,—well enough for those that can afford the time and money, but having no market value. The second is this: For some time it has been the custom in New England to act on the principle that the majority of our children end their education with the grammar-school. In the last year of the grammar-school course, therefore, it has been thought wise to place several special studies, in order to give pupils that are going out of school an opportunity to learn many useful and important things. For example, some or all of the following subjects: Physiology, Natural Philosophy, Book keeping, Square and Cube-root, and the applications of Geometry in arithmetic, come in this year; and in Boston, English History is added. This plan results in detaining pupils in the grammar school until the age of fifteen or sixteen years, and causes them to feel that, after three or four years more in school, they will be too old to find good opportunities for entering business, consequently they put aside the high-school course of study.

Now all this in our system seems a mistake. We ought to recognize the facts of the case, and the facts are these: Of the pupils that enter the grammar-schools any year, not over one-fourth reach the last year of the course (I am speaking more particularly of Boston; I presume it is so in other cities). These studies, then, come too late for the majority of grammar-school pupils, and the plan does not accomplish its implied purpose. Again, of the one-fourth that take the last year of the grammar-school, about one-half or more go on to the high school, and for them these studies are of no great advantage, as they are the regular studies in most high schools.

This plan, then, for the sake of giving to one-eighth of the pupils a little knowledge of these subjects, detains a number of pupils a year longer than is necessary, and often turns the scale against the high school. Instead of this plan would it not be wiser to drop entirely the idea that the grammar-school is a finishing school, and adopt a plan that should consider our system as a unit, beginning at the primary and ending with the high school,—one that makes no provision for leaving at any point on the journey, but which, in its arrangement of studies, recognizes the fact that many will drop out in the first four or five years of the course? By such a plan, it seems to me, pupils might enter the high school at the age of fourteen or thirteen and a half, and complete the course at an age suitable for beginning business, or for learning a trade. At all events, some plan should be adopted by which those pupils that propose to attend the high school may be relieved from all this unnecessary work. Until

something of this kind can be done, and more pupils be induced to enter the high school, it will not occupy its true place with reference to other parts of the system.

For the last few years the increase in attendance on high schools has hardly kept pace with the increase in population, and offers a striking contrast to the progress between 1850 and 1875. In 1852 there were sixty-four high schools in the State, while in 1875 the number was 212. In the last report of the Secretary of the Board of Education, the number is given as 215. Unfortunately, no record of the number of pupils was made, separately, until 1875, when there were 15,826; three years later the number was 19,311, and in the last report it was given as 18,900. This shows that the high schools have not gained in numbers for the last few years, but have gone backward a little. Here, then, is room to work; and I believe one of our most important duties as teachers is a united effort to increase the attendance in our high schools. The cities offer the best field for reform in this matter, as the following table shows, giving the number of inhabitants for every pupil in the high school:

CITIES.

Fitchburg,	1 pupil to every	51	inhabitants.
Malden,	1 " "	61	"
Somerville,	1 " "	74	"
Springfield,	1 " "	78	"
Worcester,	1 " "	88	"
Newburyport,	1 " "	96	"
Cambridge,	1 " "	104	"
Lowell, Chelsea,	1 " "	121	"
New Bedford,	1 " "	112	"
Haverhill,	1 " "	116	"
Taunton,	1 " "	126	"
Fall River,	1 " "	143	"
Salem,	1 " "	168	"
Boston,	1 " "	173	"
Lynn,	1 " "	182	"
Lawrence,	1 " "	200	"

TOWNS TAKEN AT RANDOM.

Newton,	1 pupil to every	60	inhabitants.
Lancaster,	1 " "	36	"
Milford,	1 " "	50	"
Melrose,	1 " "	50	"
Canton,	1 " "	63	"
Reading,	1 " "	30	"

This means that the people of our towns, who go to the town-meetings, vote their own appropriations, and manage their own affairs, take from four to six times the interest in the higher education of their children that the people of some of our cities manifest. Yet surprise is expressed that so many leading men in our cities come from the country. They ought to, for there great pains are taken to raise a good crop. I repeat, the cities are the points in which to increase the attendance in the high schools. I have spoken of one method that I believe will aid in this, but there is another influence stronger and better than all others combined, and of that I wish to speak for a moment,—I mean the influence of the principals of grammar schools. I speak with knowledge on this point. I had the good fortune to begin my work in Boston under Mr. Joshua Bates, of the Brimmer School, and I remember well the pride with which he was accustomed to allude to the long list of Brimmer boys that used to enter the high school every year. He made it his business to talk the matter over with the boys during their last year, and always urged them to go to the high school; the result was that a large number always entered, and some years nearly every graduate did so.

I can tell of a school that our president knows something about, that for years sent very few boys to the high school. The boys were believed to belong to a class that could not afford to attend the high school, and which the high school could do little for. After a new principal was appointed, it occurred to him that it would be a good thing for that school, if more boys were sent from it to the high school; he believed it would benefit the boys that did not go, even; he began to work, and in two years, instead of five boys, there appeared twenty-five or thirty, to take the examination for entrance to the high school.

The first year of the East Boston High School, forty-five pupils entered from the grammar-schools; this year sixty-five pupils entered from the same grammar schools, an increase of over forty-four per cent in four years; and this, I believe, is due to the influence of the grammar-school teachers, more than to any other cause. The principals and their first assistants work for the high school; they will even look up pupils that do not enter and sometimes urge them to come in. I have in mind particularly one lady (a teacher) who persuaded three girls to enter the high school this year.

This is the aid on which the high schools must rely. I mention this with confidence because all writers on education agree that good secondary schools are an advantage to those below them. It

is, therefore, a matter of self-interest for grammar-school teachers to aid the high school.

Mr. Dickinson says the high schools "stimulate into greater efficiency all the schools below them." "It is said that the elementary schools of Germany are the best in the world, because the higher schools are open to all classes."

Prest. Pickard says, "Every child in the lower schools feels the influence of the higher, and in striving after that which may be only a possibility to him, he enlarges and strengthens his actual attainments."

Another writer speaks thus: "Perhaps the influence of the high school upon the lower schools is exerted most powerfully in providing for them a class of teachers of a higher grade of qualifications than it was possible to secure under the former order of things."

There is one other view to be taken of this relation between the high school and lower schools. A decay in the high school means an increase of private schools; and an increase of private schools means a neglect of public schools of all grades.

In 1837 there were in Massachusetts forty-three towns that should have supported a high school. As a matter of fact, twenty-nine of these did not do so, but maintained private schools; and in these twenty-nine towns, the most populous and flourishing of the State, only about three-fourths as much money was raised by taxation for each pupil of school age as was raised in the other towns of the State. The result Mr. Mann expresses thus in his report: "I have been repeatedly assured that, in populous villages and central districts, where there is naturally a concentration of wealth and intelligence and a juster appreciation of the blessings of a good education, and where, therefore, the common school ought to be the best in town, it was the poorest."

This all shows clearly that these parts of one system are mutually dependent; the high school is dependent on the grammar-school for a good attendance; the grammar on the high school for stimulation. Let us recognize this fact, and work together for good.

THE RELATION OF HIGH SCHOOLS TO SOCIETY.

The relation of the high school to society might well occupy the space of another article; but I will touch but a point here and there:

(1). It furnishes, free to all, a better training in Science, Modern Languages, English Language, and History than do some of our Colleges, and it far surpasses in these respects the colleges of fifty years ago. In instruction in Mathematics and Classics it equals

most of the colleges of fifty years ago. It stands as the people's college, its doors are open to the poorest child, and its bounty is bestowed, like the gifts of God, irrespective of persons.

(2). We have seen that it is patronized by people that could not pay for their children's tuition and board at a private school; and, therefore, it increases the number of educated persons in a community, and thus is a centre of intellectual life. Prof. Laurie, of the University of Edinburgh, is good authority on this point; he speaks of Scotland in these words: "Weak as the secondary school system of Scotland now is, it was not always so: the present circumstances of our country recall us to the national duty of doing what we can to restore and preserve the learning of Scotland under new and suitable forms. This can be done mainly by the revival of our high schools, and by the promotion of secondary education in every form, in accordance with the traditions of the past; not because they are traditions, but simply because the system which these traditions hand down has been found to turn out a larger proportion of well-instructed, well-disciplined, and capable Scotchmen for the service of the country than any other that could have been devised."

(3). The high school is a benefit to society because it has a tendency to make our people more homogeneous and less clannish. But for the high school, the higher education, and perhaps, eventually, all education, would naturally be provided for by sectarian schools, and those differences that separate good people would be broadened. In the judgment of many wise men there is too much of this already. They want to see our people brought together, and to remove all distinctions that tend to create classes, or to isolate any portion of a community from the rest.

(4). The high school is also a benefit to society because it trains children of all conditions to recognize the American idea, that the only title to superiority is that arising from personal exertion or nobility of character. The daily encounters with their fellow-students in the field of study, as well as on the play-ground, are the very elements of a training in self-reliance and in a proper respect for others; a training that will be likely to "establish such relations among all the children as will prepare them for their common destiny when men."

(5). This is not all. While other systems tend to produce feelings of superiority in the minds of a small number of persons; while, in a few, they foster a pride of wealth and position; in the minds of the great mass they are apt to create a jealousy of the small educated class, and a feeling that there are no common interests between the

two. This is particularly unfortunate when one remembers that the educated minority must "receive good or suffer evil from social institutions which the majority will mould according to its own will." With the high-school system this can never happen, for the mass of the people know that its privileges are free to them; and, in fact, are especially for them. In closing, I will quote a few words from Prof. Laurie on this point:

"For the intellectual needs of the State, we require to draw forth the best intellects of the community. Nor is this all; for what shall we say of the inherent rights of the finer brains? Is that clever boy, the son of a poor farmer or of a village smith or carpenter, whose spirit is touched to a finer issue than ploughing or sowing, to be told that the State has so arranged the educational machinery of the country that he is doomed to be a hewer of wood and a drawer of water? I ask the *politician*, Is this safe for the State? I ask the "Liberal" newspaper, Is there any liberalism in this? I ask the Democracy, Where is the true democracy to be found, if not in the recognition of the just claims of each individual son of the soil? I ask those who tremble before the secret and assured advance of communism, by what counter-theory can they hope to meet it and destroy it, save by the theory of *individualism*, which involves a free and open field for the intellect of those who have been born poor?"

WHAT IS EDUCATION?

BY A. G. BOYDEN, A.M.,
Principal State Normal School, Bridgewater, Mass.

Education embraces in its scope all human relations aud obligations, all the possibilities of human activity. It is the product of the combined influences of the family, the school, the Church, and the State. It, in turn, determines the quality of domestic, social, religious, and public life, and prepares a man for his duties as an individual, as a member of the family, of the community, and of the race.

A sound theory is the guide of successful practice in education as in every other department of human effort. Theory is often regarded as mere conjecture, or fanciful speculation, and as opposed to practice. And practice, as the mere repetition of acts, regardless of their quality, and having the magical power to make the performer perfect in his work.

As defined by Hamilton, "practice is the exercise of an art, or the application of a science, in life; which application is itself an art, for it is not every one who is able to apply all he knows; there being required, over and above knowledge, a certain dexterity and skill." "Theory is the knowledge of the principles by which practice accomplishes its end."

"There is no practice without a theory," for every man, to some extent, thinks of what he is doing. The more capable and thoughtful he is, the more fully he reflects upon what he has done, the more carefully he considers what he is to perform; as he proceeds in his practice and reflects upon his performance, his theory acquires distinctness and becomes the guide of his practice.

Theory is dependent upon practice. We acquire knowledge of the action of both physical and mental forces, by observing individual instances of the action of the force; then, by reflection upon these facts, we derive the principles of their action; by further reflection upon these principles, we arrange them in the order of their dependence, and form the theory, which is the generalization of the principles upon which the practice proceeds.

Theory and practice are not opposed, but are complements of each other. Each requires the other. The theory of education includes a clear apprehension of the end to be sought in education, and a

comprehensive knowledge of the means of attaining this end. The practice includes the skillful use of these means in the accomplishment of this end.

The question before us is fundamental and pertinent, for the many popular misconceptions concerning the end and objects of education are a serious hindrance to progress in educational work.

The question can be answered intelligently only by the study of the nature of the human being to ascertain what he is, to what end he should live, and the means of attaining this end.

What is the human being who is to be educated? He is a person, not a thing. He is a free, self-active rational being; not a machine for the manufacture of cloth, shoes, nails or pins. He has a physical and a rational nature. His body is the product of all the physical and vital forces, "the most exquisite and wonderful organization which has come to us from the Divine hand." It is the medium for the communication of his thought and feeling, the instrument of his will, "the *temple* of the Holy Spirit which is in him, which he has of God." "It is a study for his whole life." Man is a part of the material world. He is a child of nature.

A sound body is the condition for a sound mind. The development and perfection of the body is to be secured for the sake of the higher development of the mind.

Man enters upon life one of the most helpless of all creatures, entirely dependent for what he shall have, and what he shall become, upon the power, care, and guidance of others. He is born into society, and while he must stand or fall as an individual, he is placed in such a relation to his fellows that he cannot grow as a man out of society. "It is there alone his faculties, expanded in full vigor, shine out; there only reach their proper use." He is the child of man as well as the child of nature.

The highest fact of his nature is, that he is endowed with that rational life which allies him to the Infinite mind, and gives him power, when he has gained command of himself, to comprehend and control all that is below him. His mind "is made in the image and after the likeness of God." He is self-active, encircling the globe in his thought and action, studying its structure and the history of that structure in the stony pages of its crust, and ranging through the starry realms of space with his extended vision. He reads the phenomena and laws of his own and other minds, and holds communion with the Father of his spirit. He is at once the child of nature, the child of man, and the child of God, "heir of all things, having the promise of the life that now is and of that which is to come." If he

chooses to be a co-worker with God, he may grow to the stature of perfect manhood. If he chooses to follow the bent of selfish inclination, he may go down to destruction.

To see more definitely what the end of education should be, we need to observe the different powers of the mind. The mind can know. It knows the objects in the world of matter and of mind. The mind can feel, and its feeling is produced by its knowledge. The mind can choose, and the choosing is occasioned by feeling. We feel because we know, and we choose because of knowledge and feeling.

The mind, by repeatedly acting in a certain way, acquires a tendency to act in that way, or *a habit.*

Habits of some kind in thinking, feeling, and acting, are formed early, and exert a controlling influence upon the subsequent life.

The child has the power to perceive, by which, if cultivated, he acquires distinct ideas of individual objects, the correct expression of these ideas in spoken and written language, and the *habit* of observing every object which comes before his mind. If this power is not cultivated, he acquires only indefinite ideas of objects, a limited vocabulary, and the habit of neglecting his opportunities to observe.

He has the power to remember, which, rightly exercised, enables him to hold the knowledge he has acquired ready for use; or, uncultivated, leaves him with a meagre knowledge of the past, and the habit of forgetfulness.

He has the power to imagine, which, properly trained, forms ideals of excellence that constantly allure him to higher achievement; or, untrained, forms ideals which entice him to evil-doing.

He has the power to generalize, judge, and reason, by which, from the distinct ideas of objects acquired by perception and reproduced by memory, he forms ideas of classes of objects, judges of their relations; derives principles and general truths; discovers laws, sciences, and systems. By the cultivation of this power he acquires knowledge of the relations and causes of things, the ability to think logically, to think for himself, to express his thought effectively. If the cultivation of this power be neglected, he acquires but a limited knowledge of relations and causes, depends on others to think for him, and becomes a follower of other men.

The distinct ideas of individual objects acquired by the perceptive powers and reproduced by memory, are the material from which the imagination forms its ideals, from which the power of generalization forms general, abstract ideas or notions; and the relations of these notions are the material upon which the power to judge and reason is employed.

It thus appears that the cultivation of the perceptive powers is the condition for the cultivation of the memory and imagination, and the right training of all these is the condition for the cultivation of the reflective powers.

I have called attention to the intellectual powers, the order of their development, the conditions, and the products of their activity. It will be seen from this analysis that the thorough training of all the intellectual powers is indispensable to the best development and growth of the man.

Knowledge occasions feeling. Each form of intellectual activity is accompanied by its own feeling. In the sensibilities of the child are found the springs of his activity. They furnish the motives to choice and action. His appetites impel him to supply the wants of the body. His desires incite him to the upbuilding of the mind. His affections prompt him to act for the good of others. His moral sensibility makes him feel that he ought to do right, and refrain from doing wrong.

His natural impulses are powerful incentives; *used*, they secure his well-being; *abused*, they insure his destruction. They have no limit in themselves, and must be controlled by the will. No part of human nature needs more careful study than the sensibilities. No powers of the child need more careful cultivation. The sensibilities derive their importance from the fact that they move the will to choice.

The mind choosing is the will, the power by which the man is capable of free action. "By will it is that man is what he is." The feelings awakened by a knowledge of the objects of appetite, desire, or affection solicit the will. Conscience, "the oracle of God in man," stands always by to tell him what he ought to do; "bearing witness to his choice, his thoughts meanwhile accusing or else excusing one another." In this presence he chooses, either in accordance with, or in opposition to, the dictates of conscience. His choice determines the moral quality of his action; his character is what he is as the result of his own free choice and action.

The will is cultivated by cultivating the intellect, which enables the man to judge more wisely what ought to be done, by listening to the voice of conscience in regulating the natural impulses, and by resolving to do always what ought to be done.

The strength of the will is shown by self-control, especially by the control of the passions when they rise in opposition to conscience, and by controlling other minds.

The action of the will is conditioned upon the action of the intel-

lect and the sensibility. The mind is the joint action of intellect, sensibility, and will. The culmination of man is "a completely-fashioned will."

We learn from the study of the mind what the mental powers are, the order of their development, the conditions and products of their activity.

The condition for the activity of the intellect is the presence of the proper object of thought; for the sensibility, the knowledge of this object; for the will, the feelings awakened by the knowledge of this object. The products of intellectual activity are knowledge, elementary and scientific, and intellectual skill; of the sensibilities, motives to choice, and the inclination to exert one's powers; of the will, choice with the exertion of energy and the increase of will-power. The product of all the powers is habits of thinking, feeling, acting,—*character.*

We learn further that the powers are interdependent. The highest intellectual activity is impossible, except the right emotions are enlisted in the work attempted, and the moral nature inspires and sanctions the effort. On the other hand, the moral nature cannot reach its highest development without the clear, keen perception and comprehension of the trained intellect, and the quickened sensibilities.

Still further, we learn that the highest development of the man requires that *all* his powers should be cultivated, that there should be unity and harmony in their action, and that he should concentrate all the energy of which he is capable in the exertion of each power.

"This harmonious balancing of all the forces which constitute the life of the soul is possible only as conscience reigns supreme over all the powers; only as God, and not self, is the supreme object of regard, "the centre about which all the activities turn."

To what end should every man live? What should he aim to be and to do? What does his nature require of him? Is it enough that he become a skilled instrument for the making of the seventh part of a pin, or the eighth part of a shoe, or the whole of a nail; or skilled in any other manual art, or in any special line of mental activity, by which he may secure for himself food, raiment, and shelter? He should be a skilled instrument in some calling, that he may be able to provide for the supply of all his wants. This is a necessity with most men.

The wants of the mind can be met only by the right exertion of all the powers. This exertion each person must make for himself.

Man is by his nature an end unto himself. The complete and har-

monious development of all his powers is the end toward which he should strive. This is the only way in which he can satisfy his own nature, or show forth the glory of his Creator. Whatever be his vocation, he should follow it with such a purpose as to make it, as far as possible, a constant development of himself. By so doing, he will be steadily gaining command of the circumstances in which he lives, instead of these exerting a controlling influence upon his life.

What are the means of attaining this end? The right exertion of all the powers, physical and mental,—beginning with the life and continuing through life,—for the development of the human mind is an endless process. The body and mind work together in the development and growth of the child. Self-activity is the law of his growth. Every power grows by exercise.

We have seen that all the powers may be *used* for the elevation of the man, or may be *abused* for his degradation.

The right use of all the powers by the child, requires,—

That the proper objects of thought shall be presented as the occasion of his activity.

That his mind shall concentrate all its energy in the exercise of the powers,

That this exertion shall continue as long as his mind can act without a forced activity.

That the effort shall be repeated till there is clearness of apprehension and the right habit of action.

That those feelings shall be awakened which will determine his will to do what ought to be done.

That the effort to do what ought to be done shall be made more pleasurable than its omission.

"The spontaneous exertion of a power, if pleasurable, is continued on that account," and ends in increase of ability and inclination to use the power.

"What the child does himself, and loves to do, forms his habits of doing."

Let this kind of activity by the child grow with his growth and strengthen with his strength through childhood and youth, and he will be brought into that state in which he will be able and willing to carry on the work of development and growth for himself. This state is Education.

Education, as an end, is that state of the man in which he is able and willing to concentrate all his energy in the right use of all his powers.

Education, as a means, or the work of the educator, is to direct and

control the activities of the child, by presenting the proper objects of thought to his mind, with such motives as will call his powers into spontaneous exertion in doing what he ought to do; and to require him to continue this exertion of his powers, until he reaches the state in which he is able and willing to concentrate all his energy in the right use of all his powers.

The best education possible is the birthright of every man, for the human race is composed of individual men, all made of one blood, and forming one great brotherhood.

The higher the education, the better the man is fitted to perform all the offices of life.

The man who can rule his own spirit, and who can use all his energy, in the harmonious exertion of all his powers, in all the various relations of his life, is the highest product of the combined action of divine and human agencies.

EDUCATION ON THE PACIFIC COAST.

REV. J. R. HERRICK, S.T.D.,
President of Pacific University, Oregon.

Before attempting to show how that which is needed is to be secured, a careful statement must be made of *what* is needed. This is all the more necessary, because the theory of mere secular education meets with more general acceptance on the Pacific slope than anywhere else, perhaps. A true view of the full culture demanded will ask sufficient delay, at the outset, to mark definitely the features of two inadequate theories, but claiming to be all-sufficient, and which, if accepted in place of the true, will prove an insuperable obstacle to a Christian civilization on the Pacific Coast.

The first of these may be called the *Scientific;* the second, the *Literary* theory. Herbert Spencer has been a leading advocate of the former; Matthew Arnold, of the latter.

What we call *nature* is a legitimate study, and very desirable. Natural science must be stretched so as to cover this whole realm, to embrace all that the scientific theory would include. The *facts* of the world of sense,—single facts, complex facts, classified facts, controlling facts,—which last we call laws, or laws of nature,—all are embraced. Here is a range of possibilities not easily exhausted. It needs a lifetime longer than that of Humboldt,—though four hours of sleep might suffice by night, as in his case,—coupled with a zeal and endurance greater than that of Agassiz, to place the myriad facts into a just classification. The controlling facts, or laws, involve the *methods* of the inorganic world and the processes of life in the organic; attraction and the effects thereof, near and remote; crystallization and its various forms; geology and the testimony of the rocks; chemistry and its combinations; electricity, magnetism, light; mechanics, and the forms of force; then, botany and the vegetable kingdom; zoology and the wonderful facts of the animal kingdom.

In its various features, nature is an interesting study; in itself considered, it is so; more, also, because of our relation to the world of sense and nature. Wherein science is practical and can be applied, its interest for us increases. Thus, after *discovery*,—that is, the finding of facts and laws not known before,—comes *invention;* that is, the putting of nature's possibilities to the service of man, the

sewing-machine in the house, the reaper in the field, the railway for the nation and the land, the steamer for the nations and the water, the telegraph for all lands and nations, in spite of the oceans which lie between. And how many more there are, conducing, in a variety of ways, to the convenience, the pleasure, and the profit of the human race!

Let us say for this theory, that it would include in its round of studies such instruction as may seem fit for the *family* and the *state*, and what is thought will enable man to live best in his material and earthly relations. And what objection is to be made to this kind of education? *None whatever, when the study of nature is made a part only*, of what we *can* know and *need* to know. But when it is claimed that man *needs* no more, and is *capable* of no more than this, we have important objections to make. And when the *scientific theory*, as such, is spoken of, this is what we mean,—to know nature thoroughly, and to be in harmony with her, as the metes and bounds of human possibility. To such a theory, therefore, these objections may be urged:

First, it does not offer to man all he needs, or is capable of. We are, indeed, related to nature, and ought to know her: but we have a relation to what is beyond nature; wherefore, to assume that we have no possibility of knowing what is beyond and higher, is to assume a position whose consequences are of vast importance,—of which *some* intimation may be given as we go on.

Second, a theorizing not properly belonging to scientific study often, if not always, connects itself with this scheme. Let us understand, natural science *proper* deals with a system *already existing*. The facts, the laws, are in the system before we know them, in order that we may know them. Observation takes them up, generalization classifies them. But the theory, not content with what belongs to it properly, tries, from itself and by itself, to step beyond itself; and its attempts are generally very lame, as inadequate as to explain a suspended chain by its links, saying that it hangs in the air because one link supports another, taking no account of the staple at the top to which all are attached, and without which no links at all could be suspended. Very much so, when this theorizing attempts the origin of all things. Chemistry, indeed, combines two or more elements, and secures a compound with new properties, and it belongs to chemistry to *show* the *facts;* and so of all the sciences. It belongs to them properly to tell us what the known facts are. So much, and no more. Huxley may *hope* to see *dead* protoplasm produce *living* protoplasm, dead matter produce *life*. But life out of death is a mere theory; na-

ture's possibilities have never shown it an actuality. Facts are against it. And yet we have in our day a good deal of theorizing of this sort which does not *properly* belong to natural science. It should neither be put forth nor accepted as such.

Again, that feature of the theory called *Positivism*, and to which the tendency is now fearfully strong, is *materialism*. This would make thought matter, *feeling* matter, everything matter. And there are those scientists who do not advocate or admit atheism, who, nevertheless, *exclude* everything *above* nature. They may, like Spencer, try to prove that a first cause and the infinite cannot be known, and that, therefore, we have nothing to do with either. More, however, *disregard*, *ignore* the supernatural in man, above man. To them, the seen is everything, the unseen nothing. They regard not the intuitions of the soul and the voice of the higher reason, and have no place in this system for God and religion. And what is its *morality?* For *this* it assumes to have. Well, if freedom is given at all, it is only this,—to keep your fingers out of the fire, that they may not be burned. Or, it may be put thus: Our life is made up of three acts,—*first*, necessity; *second*, blindness; *third*, retribution. As long as the second act *remains* blindness, *so long* the play of human life is inevitable tragedy; let this be changed to knowledge, it may then become comedy. Hence, since man can bring himself, by knowledge, into harmony with Nature's laws, and so escape retribution, it is his proper work, and all he *can* do, to change the play from tragedy to comedy. Now, if capable only of *nature-life*, this would be true of us, as of the animal; but we *have* more,—a *rational* life, higher and different, in which we possess a *moral* freedom and true responsibility, which *this* theory cannot reach, and, of course, does not include. I add, the theory under consideration is the chief support of the *secularism* of the age, which appears in church and in state, in schools and in communities, and asks for present and sense gratification; while the higher interests of morality and religion here, and of immortality and a future life, are, under the all-pervading, all-benumbing influence of secularism, little, very little, regarded. I say the most plausible, *philosophic* support for all this, is the scientific theory of education in the form of *materialism*.

That, then, will not do; how of the *literary theory?* Matthew Arnold, perhaps, may be taken as type and representative of this theory. He would, if possible, restore a Grecian culture by the help of ancient and modern literature, science, and art. He would raise men, as he says, from their low conceptions of material *having* to a more noble *being*, and would stay the tide of worldliness and ma-

terialism by a wide and generous culture of the whole man. "In contrast, then, to all grosser interests that absorb us," says Principal Shairp, "he pleads for a mental and spiritual perfection which has two sides, or prominent notes,—beauty and intelligence; or, borrowing words which Swift first used, and which, since Mr. Arnold reproduced them, have become proverbial,—*sweetness and light*,—an inward and spiritual activity, having for its characters increased inward sweetness, increased light, increased life, increased sympathy."

This is the theory; what fault is to be found with it? It has a wider range than the scientific theory. Its boast is, that everything is included, and nothing excluded, which tends to develop manhood. It takes in art as well as science, history, language, and literature. It would even admit rational ideas according to its own explanation of them; the Bible, too, alongside of Plato and Shakespeare. But if none can reach the goal *except* by this long and laborious process, I fear not many will be able to reach it. A manly *character*, if not a a full *development*, must be possible by some other and shorter-method. The Bible affirms this, and shows the way as open to all.

A very serious further objection is the assumption of the literary theory, that *mere culture* is enough. This never has raised,—it cannot, however complete, put above religion and morality as an *end*, raise man to the desired dignity and perfection. Religion and virtue, used as means, and not for their own sake, lose both their binding influence and their purifying effect. The ripest fruits of Grecian culture show this. But the radical defect of the literary theory is best seen in the *contrast* between *its* method and *God's* method, as the Bible presents the latter. God regards man and treats him as needing *regeneration and culture*,—the former that the latter may be sure and correct, as otherwise it cannot be; the theory assumes, throughout, that culture alone, without the new birth, will suffice.

The literary theory is more indefinite than the scientific, but both are defective, especially in regard to the *religious* need in the education of man. Let us then have a theory which is complete, and will not accept a part for the whole.

I proceed at once to a statement of this, which might not inappropriately be called the *religious theory*. That man is essentially a religious being is seen in the miserable substitute for it in those who try to reject it, or what I should call an abuse of our religious possibilities. My readers may not know that Comte, the founder of positivism, makes *Woman* his presiding genius, or goddess; and that this philosophy, falsely called positive, which denies the supernatural and smothers original instinct, must have, and is trying to construct,

a so-called "religion of the future"! Comte, mainly in his proper sphere of fact and generalization, is a type and illustration of the darkening, degrading influence of a system which shuts out the light of reason, and refuses to warm and satisfy the soul by a supernatural love and reverence. Forcible illustration, also, of our Savior's words, "If the light in thee be darkness, how great is that darkness."

Now notice the utterances of two eminent students of nature, and who at the same time sought the guidance of the author of nature,—*Bacon* and *Agassiz*. In his "Student's Prayer," Bacon says: "This, also, we humbly beg, that human things may not prejudice such as are divine; neither that, from the unlocking of the gates of sense and the kindling of a greater natural light, anything of incredulity or intellectual night should arise in our minds toward the divine mysteries."

It is the poet Whittier who pictures to us Agassiz in his prayer:

"On the Isle of Penikese,
Ringed about with sapphire seas,
Fanned by breezes soft and cool,
Stood the Master with his school.

Said the Master to the youth,
'We have come in search of truth,
Trying with uncertain key
Door by door of mystery:
We are searching, through His laws,
To the garment-hem of cause.
Him the Endless, Unbegun,
The Unknowable, the One:
Light of all our light the source,
Life of life, and Force of force.
As with fingers of the blind,
We are grasping here to find
What the hieroglyphics mean
Of the unseen in the seen;
What the thought which underlies
Nature's marking and disguise;
What it is that hides beneath
Blight and bloom, and birth and death.

By past efforts unavailing,
Doubt and error, loss and feeling,
Of our weakness made aware,
On the threshold of our task
Let us light and guidance ask,
Let us pause in silent prayer.'"

The poet depicts the scene further; then alludes to the fact that though Penikese is there, of the Master it must be said:

> "On a vaster sea his sail
> Drifts beyond our beck and hail,"

And closes with the tender words:

> "Thither Love shall tearful turn,
> Friendship pause, uncovered there,
> And the wisest reverence learn
> From the Master's silent prayer."

Does the genuine consciousness of any one refuse to the religious sentiment of Bacon and Agassiz, and the devout expressions corresponding thereto, a place in the development of man? What a difference in the results from *such* teaching and such learning! We cannot have manhood, complete manhood, *without religion.* Men have developed power, both wide and enduring, in proportion as they *themselves* have been developed by truths of reason and God. If we would appreciate human life and fulfill our proper mission, our minds must be fed on something besides facts and outward seeming. We need to know history, language, philosophy; a personal God above, and moral freedom within. To develop and direct *manhood,* we need humanizing studies; things of sense are not enough; we must take first, and not second,—as of greatest, not least, consequence,—eternal realities of the unseen and spiritual world. It was the religious atmosphere in which they were reared, which gave health to the intellectual lungs of John Milton and William Shakespeare. What were "Macbeth" but for its *moral* element, or "Paradise Lost" without its religious thought? Recall an ancient writer,—poet, orator, teacher, all in one; philosopher, moralist, theologian, too, all in one: but not possessed of much of that special knowledge, thought by some essential and adequate; yes, if you can, think of *Plato,* stripped of higher morality, stripped of his rational ideas! He were, then, weaker than Samson shorn of his locks. His thinking, his teaching could not have lived into the Christian era,—not beyond his own age, any more than Shakespeare's plays without their supernatural power, could have lasted longer than the stage on which they were acted.

The *religious* element, then, must enter the education of the young. We must *have* this, and not allow it to be pushed aside; for, if there is a supernatural world, and man is related to it; if there is a personal God, and man is accountable to Him; if the Bible is

true, and we have need of that Christ who is revealed in it; then, surely, any system which finds no need of God and the religion of the New Testament is erroneous, — fundamentally, radically so,— whether it is proposed for the individual or the race.

Nature has her demands,—this is granted; but if there are laws of freedom, spiritual laws,—and there are,—*these* are not to be discarded. If man has a conscience, the center of moral action, and a God above, the center of religious action, why should he not know *moral* science, and theological science, quite as much as the science of nature? I say, if there are, as we know, *moral* laws distinct from nature's, then the former *ought* to be known, *in their way*, as thoroughly as the latter, in *their way*. If a God is, *He* is to be known; and this human-descended science, practical as the life below and real as the life above, is, to say the least, as worthy of our study as any which is earth-born. The human mind should have *all* its possibilities unfolded, and be trained in a system *able to supply* its real wants. This being so, we cannot rightly put aside, in education, the *new life;* for though not derived *from* the human it is yet to be developed *in* it. Let nature's laws, indeed, be studied till they show the need, and, when studied aright, they will show the need of something higher than themselves to bring humanity to perfection. But after all, how can the inefficiency of human wisdom be known, except in the light of divine philosophy?

Let me ask again, if this superior wisdom is for *all*, designed for, adapted to all, *when* shall we *begin* to learn it? He who has made us knows our wants, and when He reveals His will is it not safe to teach it to *children?* For the same reason it must be to them more *valuable* than any other knowledge. Besides, the *discipline* needed is best secured by their being, from the first under *positive authority*, both to earthly parents and to the Heavenly Father.

Wherefore, let us demand for the young an education based on God's authority and Christ's gospel. We must reject an infidel system, and a semi-infidel no less, and adopt a *Christian* system, which may render our children more truly religious,—not tend to raise up a generation of materialists, pantheists, and infidels. To *mistake radically is to fail necessarily.* Our want of success is because of not building on the right foundation, the "chief corner-stone." The human soul is made for God and immortality; we are to treat it accordingly. The world's real progress, we know, is due to the vital power of Christianity. Those nations prosper best that are most Christian. Those parents and teachers succeed best whose efforts are regulated by Christian principles, and those schools and colleges,

other things being equal, do most toward the development of a manly character which are most truly religious in their influence. Since these things are so, we ought to have confidence in the divine method and means of elevating and training men,—have our views and our methods conform to God's. When we do, our effort in education will be, I think, to give greater prominence, not to *nature's* laws, to *God's* laws.

Secularism must sooner or later confess its inadequacy. Is it not wise to avoid the results of its false lead? We need, relatively, to-day to emphasize, not so much *natural science* as *moral science, things made* less and their *Maker* more. The *Creator* rather than the creation, the *One First Cause as personal* rather than the many secondary causes as impersonal,—this is the great need of our time, and in education not least.

It may thus be seen in general what is needed, and an intelligent foundation is laid, for considering *how* the needed education is to be secured on the Pacific Coast. Under the term "*education*," more is meant than secular knowledge gained, or the most ample scientific training. It is the culture of the whole man, that he may realize his utmost possibilities. Quite as little is it, what this or that religious sect may assume needful for its own advantage; rather what each and all need,—what the whole community greatly needs, and without which the highest well-being, present and future, of this great and fast-growing region cannot be secured.

We may safely start with the position that *this coast should make provision for the full education at home of her sons and daughters.* As we know the Pacific slope did not attract people, as New England, by its superior educational and religious advantages; and the gold and gain found here have not supplied them adequately. Man cannot live on gold-dust and material prosperity. California and Oregon are groaning within themselves for something better. Their unavoidable isolation would seem far less, under ample facilities for a true education, or become quite a desirable sort of isolation.

Some young men and women, awakening to a sense of their need, go East to find there what they fail to find here. But only the more wealthy can afford to do this. And surely the more promising youth, the best scholars, are not all, or many of them, able to go East. They must have their education here, or go without it, and by far the greater part will go without what they cannot secure here. The time is already come when it ceases to be a question whether or not ample provision should be made here for the full education of our youth on this coast.

Let our next inquiry be whether we can rely on State institutions to supply the demand. They may carry some branches of secular instruction to a very high degree of perfection. Suppose they do all of these. Will that suffice? Certainly not, as has already been shown. State schools, in our day, are trying the experiment of not giving religious instruction. But secular education has never yet shown itself competent to supply the wants of civil government, or of the social community, any more than of the man himself. Or rather, because such education cannot develop real manhood, it proves inadequate everywhere. The healthful influences which pervade and transform and mould the whole community, do not derive their source from secular, but from religious institutions.

Let us, then, next inquire whether the denominational schools can do for us what we need. Of these we have many up and down the coast, in California and in Oregon. Why so many? Because each sect has had here a mission, and each mission has desired a school in its own interest, and to have each school become a college, hoping, very likely, that others might not become such. But calling a school a college does not make it such. The name has not given the thing neeedd

Dr. McDonald, of San Francisco, formed a plan, and made a liberal offer, for a Christian University. In doing this he assumed, as I have done,—first, that full provision should be made on this coast for the education of the coast; and, second, that the State institutions cannot be relied upon to give a Christian education; and lays it down also as an undoubted fact, that the denominational schools have proved, and must prove, a failure in the higher departments of education. Why so? He answers, in part, for want of funds. I answer, more fully, for want of funds, for want of scholars, and for want of a constituency able to maintain a proper college. Each and severally, the denominations cannot provide the needed higher education. There must be combination. Dr. McDonald says this, but thinks it may be by sects as such. Out of deference to sectarian claims, he would even have his president elected once in three years. But every educator knows that no institution could succeed under such management. It is the weak point in the good man's scheme. The rather have the institution Christian, evangelical, but not sectarian, raised above that,—independent of it; let it be in the hands of Christian scholars, and under a board of men fairly representing its patrons; then all the best Christian people, as such, not as sects, will come to sustain it.

Let me illustrate. In 1872, while in Constantinople, I preached in Robert College to some two hundred boys of sixteen different dialects. Wondering at the earnest attention of these youth, I asked

President Washburn, "Do you regard any of them as Christians?" He replied, "Yes," referring particularly to one of the best scholars, a Bulgarian. "Has he declared himself such?" I said. "No," he answered, "nor do we ask it; in due time we presume he will do so; if missionaries we might press it now, but as educators we cannot. It would drive from us those whom we would benefit, and whom we hope to see become Christians. You may be surprised, if I tell you, that this is not a Protestant college; it is Christian, not Protestant. We can, and do, give in it daily religious instruction, with unrestricted Sabbath services, as you have seen." At the start the missionaries, as I learned, feared this college might not be a positive help to them in their efforts; but the results showed their fears groundless, as they themselves said to me when there. Now, put sectarian in the place of Protestant, and this illustration serves my purpose well. So do we need, so we must have, or fail of securing the genuine college which can educate our youth,—must have an institution Christian, but not sectarian. Our ism is not to stand in the way of a higher interest. Education proper need have nothing to do with denominational lines. These only hinder when the attempt is made to place them around it. The rather let us have grounded in Christian confidence, and devoid of jealousy, a generous co-öperation; then will the sects themselves, each and severally, be strengthened, and together exert a much greater and more healthful influence for Christ and his cause. How much better this than for each one to say, I am of Paul, and I of Apollos, and I of Cephas, and I of Christ,—as if the Christian cause itself could be divided, or as if a really Christian culture were not the same denomination, or no denomination! how much better than the sectarian effort, which cannot succeed, and which is only another illustration of losing life by seeking, in our way, to save it!

Even suppose a theological department needed, it is not now, but will be, much sooner by unison; then more than for the sake of economy,—which is much,—there should be coöperation. Why not? Do Congregationalists need a different exegesis and interpretation of Scripture from Presbyterians, for example? Is not church history the same for both? Is not a systematic course? Is not sermonizing and pastoral theology? And how few lectures could be required to give the specific difference in church polity; *i. e.*, in the organization and discipline of the different sects? Can any good or Christian reason be given for the two weak theological seminaries in California? I trust the false lead may not be followed in Oregon. Christian givers in the East desire union and success, not division and defeat. And if in theology, much more in other departments, in all prepara-

tory and college studies, there should be unison, to accomplish thereby what no one denomination can do alone. Religion and Christianity should be in schools; sects and denominations, not. So I believe and hold.

A further explanation is here necessary. A school is, in name, sectarian, when directly under control of some given denomination; in name, undenominational, when not under such control. But do not mistake,—a so-called undenominational school may be made, in fact, denominational. Let its trustees be chosen simply because of their church connection, while representative men are not invited into its board, because, and simply because, they are of a different persuasion; in short, let the denominational interest determine where the educational one should do so, and what is the legitimate inference? Surely something more than the name is essential, that all denominations may feel welcome to a Christian but not sectarian school.

Olivet College is an illustration in fact of what I would say, and of what I would have more than theory in this scattered population of few churches and few members, and where unity of action is far more essential to success than in Michigan. I give the testimony of President Butterfield in his own words: "Olivet College was founded in 1844, by a colony from Oberlin. No conference or presbytery stood sponsor for it. Its first friends were mainly Congregationalists; but, as the years rolled by, Presbyterians,as individuals, became interested in it, and consented to serve on its board of trust. Two-thirds of the money has come from Congregationalists, and two-thirds of the trustees belong to that body, but neither Presbyterians nor Congregationalists are formally and officially recognized. Congregational and Presbyterian bodies commend us, but it is simply an expression of their good-will. They send visitors, but they exercise no authority over us. You will observe that the union of the two elements is natural and voluntary, not formal and ecclesiastical. It works well. Not an ecclesiastical ripple has appeared. It promises to work well." He adds, "I hope that Pacific University is to be a success." That it may be, shall we not have unity and coöperation here, such as is so happily exemplified in Olivet College?

Can we not say with a Bible translator and theological teacher in the Orient,—"It is the right thing for the Christian people of Oregon to give largely for the institution;" and as to these two bodies, "not only is there no reason why they should not unite, but there is the strongest, indeed every reason why they should." In very many places they ought to be united ecclesiastically; and certainly in educational work there is no excuse even for their working separately.

You must see, from what has been said, that I emphasize the im-

portance in this region of one institution so endowed and supplied that it can show by giving it, what a truly higher and Christian education is. It need not seem strange that the supply must awaken the demand. This is so elsewhere. Raise the best wheat, if you would command the market; show your superior horses, cows, and sheep, if you would have the farmers buy them; make the best paper in the State, then the people will have it. In education the same is true, and more also. Harvard College graduated its first class in 1642: "For Christ and the Church" its motto, a Christian institution of high order, and fostered by the State, and to do a work not appreciated by the many, and for which at the time they seemed quite unprepared. It was sixty years before the next college, Yale, was founded. This, like Harvard before it, was a Christian institution of high order. Another fifty years passed, then the college of New Jersey, "Princeton," came into existence. And what a vast, untold influence these three colleges have exerted. The total effect of a Christian college, if both a college and Christian, is vast indeed, though greatly underrated.

Two years ago, in a paper read by the librarian of Yale College before the Massachusetts Historical Society, this position was taken, which places in a forcible light the importance to a forming community of a college which is such indeed: "It is hazardous to transpose history, but I do not think it rash to say that a failure to plant and endow Harvard College for five-and-twenty years; that is, until the most of the generation of educated men who came over had passed away, would have so stunted and paralyzed the social progress of Massachusetts as to have essentially altered the whole course of events bearing on national history in which Massachusetts has had a part." In such a college the best minds are educated, and thus it prepares the leaders. It helps to awaken and direct the right sentiment in regard to education, as also a desire to secure the full benefits of the best course of study. This age, and every age,—this nation, and every nation,—this part of our land, as well as New England and other parts,—needs, and ever will need, the education which only a first-class Christian college can give.

I speak of *one genuine college* for this region, not many; for many there cannot be for a long time to come. Various academies, fitting-schools, feeders, may help on the needed work; but all trying to be colleges, they hinder, greatly hinder it. They thus fail of the proper dignity and efficiency,—are weak, secure small patronage, want the enthusiasm of numbers, exert very small influence, and thus open the door to bad influences in the community which a wise coöperation might keep out.

Moreover, the one institution should be for *both sexes*. The first colleges in our land were for men only. Now, provision must be made for the other sex,—this either by separate or by coëducation. The sentiment in the older States has favored the former method; the newer, the latter. Still, coëducation is gaining favor in most places. Surely here it would not be necessary to argue the point that provision should be, and can best be made, for both sexes in the same institution. But I must ask your patience to some words on the higher education of women on this coast.

It is only about forty-five years since Mary Lyon,—under the strong conviction that young women ought to have, at moderate expense, the possibility of a full education,—founded Mt. Holyoke Seminary. Such institutions could not be called colleges then. It was even thought by some in New England, fifty years ago, that females did not require further opportunities. But, from the first, this seminary was overcrowded. Since then many similar institutions have been established in the States, in many missionary fields, and recently, and with astonishing success, in South Africa. Schools for this sex now venture to take the dignified name of college,—as Vassar, Wellesley, and Smith; this last claiming to be on a par with Amherst. The University of Vermont, that of Michigan, and some other colleges, as well as Oberlin, open their doors equally to females and males. Harvard in this country, and Old Cambridge in England, are making provision for women, as well as the University of London, and recently both are conferring equal degrees to both sexes. Besides the superior private instruction with which women of the higher classes have been favored in England, the institutions in that country for the higher education of women are over fifty. "In Germany, and several other European countries, the State Governments, as well as the municipal authorities, have in the nineteenth century begun to establish female schools of a higher grade."

The progress in the higher education of women in the United States is indicated in these statistics: In 1870, 33 reported to the Bureau of Education. These had 378 instructors and 5,387 students. In 1874, 209 reported, having 2,285 teachers and 23,445 scholars.

Surely, not to make ample provision for the education of women is to be behind the spirit of the age in which we live. This elevation of woman by education,—due more to her than to man,—is likely to have very much to do with the spirit of the ages to come, and with human progress. Whether we are behind in this matter, judge ye. It is a question of vital importance,—that of the higher education of women. They need the better Christian education for teachers; for, when educated, they are in many respects better teachers than

men. At any rate, as has been well said, "It is best that the minds of youth should come systematically in contact with teachers of both sexes, to such an extent that the teaching, character, and influences of one sex shall fairly supplement and qualify those of the other."

You may say, "Women are destined to be wives and mothers." Very well; let it be so. Then, I ask, can any one measure the influence, in her own family, of the true and well-educated woman? Or the difference whether she is educated or not?

Which sex, when all is told, has really most to do in forming society? Recently I have fallen on these two suggestive passages; the one, "The proper education of women has been recognized as an important, perhaps the chief, factor of social progress." The other, this: "What is pure and modest and feminine in woman lies at the basis of our social purity and welfare." Has the Pacific Coast the means of giving that intellectual and Christian culture which woman should have? I think not; and yet, rightly considered, the Pacific Slope cannot present to-day a more imperative demand than this. Let adequate provision be promptly made, and I believe one generation would give back a hundred-fold reward. The difference for the future between having, or not having, what is needed for this object is beyond the possibility of any one to declare.

Let us have, then, one well-endowed institution, able to give to both sexes a really higher and Christian education. Another has said, "Pacific University must be the Amherst of the Northwest Pacific. Yes; the Amherst and the Williams, too." Why not add, "And the Mt. Holyoke, also"? for both sexes are to be cared for in it. And why not *this* institution be the one? Is it not established, and has it not secured a reputation for thoroughness second to none? With what it now has, cannot Pacific University more easily be made what is needed than any other school? Is it not so located that it might easily supply all this Northwest Coast with the higher education required? Can it not be unsectarian in fact as well as in name? And why should it not be thoroughly Christian?

The question now pressing on the trustees and friends of this institution, I take it, is this: "Shall Pacific University be made what it may and should become?" It has done, in the past, a good work,—all thanks to those who, in trial and self-denial, have labored in its behalf! But of late, for various reasons doubtless, it has been holding on rather than going forward. And yet, to keep step with the rapid growth of the country, and to provide for it, meantime, Pacific University must take a new departure, and this it should do at once, not thinking to provide for what is to be on the scale of what has been. To do this, of course, funds are necessary; a liberal addition

to endowments for salaries, funds for libraries and apparatus, and a scholarship fund to aid needy and deserving students. Besides these demands, three buildings are needed; or, if we do not name a president's house, provided and owned in many places by the institution, two; the one, a central main building which has always been to be, but is not yet, but which should contain a commodious and tasteful chapel, library, cabinet, and recitation-rooms; the second, a ladies' hall which, under a matron, can allow the pupils to economize by doing their own work, and, under Christian teachers also living in it, be a home for the young ladies; their manners, morals, and Christian character being cared for as directly as at Mt. Holyoke or Wellesley; and where also, under proper supervision, both sexes may take their meals together.

If, now, having studied the Pacific Coast from an educational point of view, I should make confession of my faith in this regard, it would be something like the following: I believe in scientific study, but not as embracing all which man needs, while I utter my protest against that materialism into which some would plunge us. I believe in culture, too, but not as being sufficient. As I believe in God, so also in a truly religious education; and as I believe in the Bible and the Lord Jesus, so I believe in a thoroughly Christian culture. Such an education is what this Northwest Coast needs in the form of higher education for both sexes. But while it cannot be secured by merely secular schools on the one hand, so on the other I see little hope of securing what is, in reality, needed by separate ecclesiastical schools. In this scattered population, not well appreciating the college, what it should be and what it should do, there must be concentration, union, coöperation of the forces and resources, if we would obtain, supply, and make effective, one such Christian institution of high order, that can be a power as a controlling influence for good, increasing more and more through the successive generations.

I look to the development of the whole man as alone worthy to be called education. I regard adequate provision for the higher education of young women as very important, and I believe a ready and ample supply of the wants of Pacific University as having a vital relation to the best good of the North Pacific, both present and prospective. I look upon this as of more importance than railways and every kind of material wealth. I also regard it feasible, with proper union and liberality of effort *now*, to secure what delay will render less certain and of inferior value. Oregon and Washington have needs many, no doubt, but the greatest of all is that of manhood and womanhood. If true prosperity can come without these, it must be against the testimony of history everywhere and always.

THE PLACE OF THE LECTURE.

BY ISAAC SHARPLESS.

The formal lecture, as a means of instruction in schools and colleges in this country, has fallen into disuse bs the most successful educators. In its modified form, as a Socratic dialogue between teacher and pupil, it yields abundant good results. The American college student is, in general, too immature to make such copious and judicious notes of an hour's uninterrupted lecture as to develop the subject in his own mind afterward. He needs the system and the fundamental facts of a text-book of reference, on which, as a skeleton, he may place the warm and living tissue of the teacher's explanation and illustration. The pure lecture is to most classes uninteresting and does not invite investigation. The lecture, to a class of students who have already worked up the subject, interspersed by pertinent questions from them, illustrated when feasible by blackboard or chart, is a most pleasant and stimulating exercise.

With a full knowledge of the book which the class has studied, abundantly supplied with collateral information and illustrative facts, the teacher meets his students. A few questions put to one of them soon show how faithfully he has done his work, what difficulties he has found, and afford a good basis for a long and informal talk, in which the statements of the book can be explained, modified, and criticized, and the opinions of other authors presented. The accumulated knowledge of other students will soon be drawn into the common fund by judicious suggestions, and their various crudities and inaccuracies exposed and corrected. The text-book will be truly a book of texts, on which the teacher hangs his sermons. The class learns to criticize, to weigh evidence, to come to conclusions. It is stimulated to search in cognate fields, and feels something of the glow of original investigation.

"The recitation, considered as an opportunity of examining a student, to see whether he has learned the lesson of the day, and to give him a mark of merit or demerit, has well nigh disappeared from the University. It has become for the teacher an opportunity to give conversational instruction by asking questions, addressed either to an individual or the class, with a view to correct misapprehensions, and to bring out the main points of the subject clear of the

details, by explaining the author in hand, or contravening, illustrating, or reinforcing his statements. For the student it has become an opportunity to ask questions; to receive either in a critical or docile spirit the explanations or opinions of the instructor; to review the lesson or re-examine the subject of the day, and to test, occasionally, his own power of translating or stating a proposition, a case, an argument, or a demonstration; of narrating a series of events, or of describing a plant, an animal, a disease, a building, a person, or an institution. For teacher and student alike, the recitation gives opportunity for personal acquaintance and a somewhat intimate intercourse. In many recitations, so-called, the teacher does the greater part of the work." [1]

Any one who has tried the experiment of examining a class on the matter of a lecture delivered the day before, on which there was no examination expected, knows how little even the best prepared student can tell of it. The writer has repeatedly attempted to draw from intelligent young men the main points of lectures,—points which had been emphasized and illustrated with great care.—and his repeated failures have convinced him that such lectures, *as means of instruction*, are so much energy wasted. The audience may be interested, excited, or pleased; but it is not, except in a few cases, where the recipient has given special study to the subject, instructed. A young man cannot be educated by lectures alone, no matter how excellent they may be. Much careful preparation and mental exertion, much money invested in costly scientific implements, fail fo their intended object, because they are presented to students in the shape of elaborate formal lectures, for knowledge of which the student is held to no accountability. The facts going into his brain through no mental exertion of his own, find no permanent lodgment there.

We would not intimate that such lectures are useless. While largely so for the purpose of instruction giving, they subserve another purpose of exciting interest in the subject, and making it popular. If skillfully written and delivered, they will set some of the hearers to work in the field, and stimulate reading, study, or observation. While not doing this so successfully or so systematically as the Harvard "recitation," they need not be accounted as absolute failures. While not lodging facts permanently in students' minds, they give a general impression that there is something worthy or grand, or interesting in the subject treated of; something which has induced a person toward whom considerable respect is felt, to

[1] From Report of President Eliot of Harvard, for 1879–1880.

spend time and effort in presenting it, and consequently which is worth time and effort to procure; which promises more as the result of more exertion, and toward which a certain propulsion is felt. The student's mind is put in a favorable condition for the reception of knowledge and for healthy growth, and if then taken in hand by a skillful instructor, can readily be induced to utilize the interest begotten by the lecture.

No lecture should be given in a school without being followed by a requisition, on the part of all students capable of it, to write a synopsis of it. It should be followed by an elaboration of its contents at a time which will allow of asking and answering questions, and a definite course of study should be marked out for any one desiring to continue the subject. These three things are necessary to prevent the time and money put into lectures from being thrown away.

Some of the same remarks apply to public lectures. Attendance being voluntary, and obtained at some cost, only those who are interested usually are found there. Hence, more attention is paid to the lecturer's remarks, and more instruction is gained from them. But in this case, too, the stimulation of interest in the subject is the principal advantage. The lectures of Prof. O. M. Mitchell on Astronomy, a few years ago, aroused a wonderful enthusiasm for its study. Themselves not remarkable as statements of facts, they conveyed the idea that something extremely fascinating was to be found in the subject from which the facts were drawn. In general, a "run" on the books of a public library follows a successful course of lectures.

It is, therefore, much to be regretted that the prevailing "fashion" in public entertainments is not in the direction of substantial lectures. A person is more apt to get what he pays for in a humorous than in an instructive lecture. He is amused in one case, while he is not usually instructed in the other. And this fact, and the general tendency to ups and downs in any institution, may explain the present lethargy of the lecture bureau of ten years ago.

But the public suffer by the change. The comicalities of Burdette and Nasby please for a moment, but result in no lasting good. It is the illustrations of Gough's lectures,—illustrations which apply equally well to all the subjects on which he speaks, rather than the principles involved,—which people hear and heed. The stimulus to investigation is withdrawn. A state of mental passivity and immediate forgetfulness is now all that is required of the lecture-goer.

The character of lectures is an index of the intellectual standing

of a community. Any one will go to hear a discourse on a subject in which he has an interest, so that the relation exists in both directions. Mental sluggishness causes a dearth of good lectures, and the lack of lectures perpetuates the mental sluggishness. Were there no antidotes, the matter would go on from bad to worse. But so numerous are the educating agencies in public society,—the newspapers, the great illustrated monthlies, the societies for home study, and other institutions which reach the more intellectual classes,—that it cannot be fairly stated that the decay of the lecture system is in exact proportion to the decay of mental life.

In an eastern city of fifty thousand inhabitants, known to the author, there has not been a real lecture for several years. In our large centres of population the popular courses are now composed principally of humorous and musical entertainments. Such speakers as E. A. Freeman, who can give facts well worthy to interest cultivated people, have spoken in them to empty benches. It is so everywhere, more or less. The lecture bureaus have no call for lecturers. Cheap musical talent is more in demand than fine oratorical powers, or the results of ingenious research. It is a subject worthy of investigation, whether this does or does not reveal a change for the worse in the mental habits of cultivated people; whether or not money-getting and money-spending are exhausting more and more the energies of the people, so that they have no zest for culture of the mind.

The great preventive of these evil tendencies lies in the right education of the youth, in the strict *régime* of college life, which begets some mental training and certain right mental habits; in the spread of college ideas which subordinate the sensual to the intellectual, giving the young man nobler ambitions than to excel in wealth or to keep an expensive establishment; which holds before him the exceeding dignity of knowledge and the power of a trained mind.

While the trashy weeklies of the day furnish the food of many families of repute, destroying all good impulses and warping the motives of growing boys and girls, not much can be expected in the way of appetite for, or power of digesting, wholesome literature or lectures. But when this can be made to give place to the Greek and Geometry of College; when real work is done with a definite end in view, then the index points in the direction of hearty encouragement of solid intellectual agencies.

THE POLYTECHNIC SCHOOL:

ITS GENERAL COMPOSITION AND ITS GRAPHICAL WORK.

BY S. EDWARD WARREN, C.E.

We will begin this article with a series of pertinent facts, and more or less clearly obvious general principles, briefly stated, and will then follow on to some applications.

1. In choosing the designation "Polytechnic School" for our title, we mean the same kind of institution which, in the present conspicuous lack of uniformity in the matter, is also called "Scientific School," or Technical or Technological School or Institute: all having practically the same meaning; viz., schools for teaching the applications of the principles of mathematical, physical, and natural science to the useful arts.

2. There are and long have been two ways of gaining an education of any kind or degree, as regards the agencies employed for the purpose. These ways are that of private or individual instruction, and that of school or class instruction.

3. There is a remarkable difference among the various grades and kinds of education as to the proportion of pupils found engaged in study in each of the two ways just pointed out.

The common school and the college were planted early, or at the outset of the career of the American people, and nearly or quite together. But preparation for college was often gained by private study with the minister, or other scholarly man. Now, however, elementary, preparatory, and collegiate study is almost wholly conducted in institutions, public or private.

4. Leaving general for professional education, many living persons can remember to what a large extent preparation for the gospel ministry was made in the study of some noted pastor, of sound learning and strength of character, as compared with the number who were prepared in theological seminaries. The like is true to a greater or less extent of the study of law or medicine.

So also, in a very marked degree, has it been with the professions of architecture and engineering in their various subdivisions. England, from the days of Smeaton (1724–1792), Tredgold (1788–1829), and Watt (1736–1819), not to mention the pioneer Yarranton (born 1616), and the Welshman, William Edwards (1719–1789),

has had her eminent engineers, largely self-made, though aided by books or schools, or older professional guides, under whom to serve a virtual apprenticeship.

In our own early history, the names of Ellicott; Geddes, the surveyor for the then proposed Erie Canal, in 1808; Gridley Bryant; B. H. Latrobe,[1] and others, will occur as examples of eminent engineers, who, by diligence and force of character, have risen from the ranks, not without the aid of books, but without the aid of special schools of engineering.

5. Of all grades and kinds of education, professional education in architecture and engineering, especially in the former, is that for whlch theprovision of appropriate professional schools is the most recent. The experiment now going on in them is to determine whether, on the whole, better engineers, etc., are made by the old, or virtual ap prenticeship system, as it may be called, or by the engineering-school system. It will also demonstrate the truth or error of the proposition implied in the argument that, if the men above-named and others like them, accomplished what they did with the scanty aids which they had, what might they not have done if they could have availed themselves of the services of a well-manned and equipped engineering school.

6. The distinctive character of the two methods here indicated may be roughly stated as follows: The empirical, experimental, or apprenticeship method gives familiarity with details of practice, with actual instead of supposed cases, and with expedients. Except as a good knowledge of mathematics and mechanics has somehow been gained, it also leads to a dependence on precedent or on "happy guessing," rather than on an intelligent application of mechanical principles to the designing of structures.

The school method tends to make theory more or less highly prominent, though by no means exclusive. Perhaps we should say principles instead of theory, as this much-abused word is too much understood in this and similar connections to mean mere visionary speculation. By theory we here mean, not a body of supposed scientific truths which possibly may account for natural facts and so guide practice, but a body of real and demonstrated truth which does account for phenomena and correctly guides practice.

7. Each of these methods has superiority in its own field. The Hoosac Tunnel and the St. Louis Bridge, not to mention other equally great works, are, in their own way, such a school to the young

[1] Stuart's *Civil and Military Engineers of America.* Van Nostrand, 1871.

engineer who studiously follows their construction from beginning to end, as no institution can be.

On the other hand, it has been said that some who may be strong in the artistic, or executive elements of their total qualification, but weaker in the mathematical ones, are compelled to call in the aid of experts in mathematics and mechanics,—graduates of technical schools of a high order,—to make the computations and intricate drawings which are necessary when large, difficult, and comparatively unprecedented work is to be done.

8. It is, accordingly, an open question, whether polytechnic schools should lay out their time and strength mainly in securing fullness and thoroughness on the several bodies of scientific theory,—mathematical, mechanical, etc., on which the various engineering specialties depend,—or whether, by means of many and well-used laboratories, and lectures on real practice by professional experts, such schools should make school training as nearly like actual professional life as possible.

9. It may, perhaps, indicate a correct answer to this question to simply remark that the theory, as explained above, is of undoubted importance, and can probably be gained in the school more conveniently than anywhere else; and that the best practice is to be had in real life, however successfully and advantageously the school may initiate the student in it.

To discuss this question further here would, however, lead us too far away from our immediate purpose; and we, therefore, proceed to say that one must have some clear general ideas as to what a well-developed Polytechnic school as a whole is, or should be, before the proper scope and extent of any one of its departmeuts can be understood. Hence the two-fold sub-title of this article.

10. A certain difficulty arises at this point, however, which it may seem ungracious to mention, in view of the rapidity with which technical schools have sprung up in this country; the zeal and enthusiasm with which they have been organized, managed, and attended; and the generosity with which some of them have been endowed. This difficulty consists in a more or less general lack of adequate apprehension of the character, scope, and bearing of some, at least, of the fundamental studies pursued in this class of schools. In a word, American polytechnic schools are so recent that it is quite essential, to the best results, in the absence of a large scientific public, that graduates, and other accomplished practical scientists, as well as gentlemen of literary culture and business talents and experience, should be influentially represented on their managing boards.

11. But passing by the difficulty just noted with only a brief mention, as one which would seem likely to correct itself before long, we will next attempt to distinguish clearly between a trade and a profession, and thence between a trade or industrial school and a polytechnic school.

A trade, that of a carpenter, or harness-maker, or any other, may be said to consist of a series of operations, the order and manner of which have to be learned by practice, which, of itself, gives the operator an increasing facility in the performance of those operations, and practical acquaintance with the nature of the materials on which he works.

A profession involves, in addition to this, a knowledge of the natural principles,—mechanical, physical, chemical, or other,—on which actual or possible processes depend, and hence involves, with this knowledge, power to certainly apply such principles to new cases, which present new requirements.

Or, even if we take a lower view, and say that a trade and a profession differ more in the degree than the kind of knowledge requisite, still the difference is great. For a shoe may be as handsomely fitted to a wooden foot as to a living one; while, to amputate the latter requires such a knowledge of its internal structure as will govern the necessary operations: and the still higher achievement of saving the foot requires a further knowledge of the action of its parts under various conditions.

But accepting the former distinction, as one of processes or of principles, as essentially correct, a trade-school would chiefly train the hand in the performance of operations, while a professional school would also afford thorough training of the mind in the body of principles on which the processes depend.

12. From this broad idea of what a polytechnic school is, we pass on to add, that any such school may propose but one course of study leading to a degree, or it may propose several. The former is mono-professional, fitting for one profession; the other is poly-professional, fitting each of its pupils for some one of several professions. Both are polytechnic, in that they afford instruction in the practical applications of many distinct sciences.

When we say several professions, it must be understood that, to a large extent, varieties or specialties of one comprehensive profession are meant. For, as oculists, aurists, dentists, and others, are specialists in medicine and surgery, so road, bridge, hydraulic, mechanical, mining, sanitary, electric, and other engineers, are specialists in the comprehensive profession of civil engineering. Besides engineering

in this broad sense, are architecture, with various specialties, church, domestic, etc.; and the technical applications of physics, chemistry, geology, and natural history, to heating, lighting, etc.; to the manufacture of chemicals, as sulphuric acid, or to the industrial uses of chemicals, as in dyeing, soap-making, etc.; to mining; and to forestry and agriculture.

13. The Great Eastern is a fleet in one vessel, and is not a success, physically or financially. Physically, it can be in but one place at a time, while the equivalent fleet might be in five, giving a larger aggregate accessibility and accommodation. Few places can accommodate it, or find a cargo for it, and while it is loading the fleet might be sailing.

The parallel may not hold in all respects, but we confess to a preference to that application of the principle of division of labor, which assigns one work to one school,—at least, to the extent of limiting the work to the specialties of one comprehensive profession.

We thereby retain, if we wish it, whatever of richness lies in the idea of a compound unity, whether in the separate specialties in the final year of training for the one profession provided for, or in the several chairs of instruction, each complete in itself, as to its specific work. But we do not introduce the complexity which may be called decompound.

The dilemma is this: If an institution which undertakes to teach all the specialties of all the professions is organized as a unit, in having one undivided faculty, inextricable confusion and conflict inevitably arise. Subjects common to various courses bear differently on each, and hence should be given differently to each; and the young student is bewildered by the multiplicity of choices placed immediately before him. But if each professional course is housed in a separate building, and with a separate faculty, to the full extent which is desirable, thus forming really a separate school, these schools would better accommodate the nation at large and the particular industries affected by them, if they were scattered, so that each should be in a centre of the industry served by it, if that industry were a local one.

But we pass on to another point:

14. The present educational position of American polytechnic schools, however designated, is mixed, decidedly mixed. This is true, both of their work and their affiliations.

As to their work, they are all, in part, doing the higher preparatory work of high schools and academies, in teaching some of the subjects which ought to be required for admission, for the reason that they are as elementary as are many of the subjects which are

required for admission. This is notably true of elementary mathematical or mechanical drawing,—a study which, moreover, would be practically useful to thousands who can get it nowhere and never, if not in preparatory schools; and would contribute largely to make such schools preparatory to intelligent, and honored, and satisfied industrial life, as well as to college or mercantile life.

Polytechnic schools are also doing, in part, the work of colleges, in so far as they teach history, literature, philosophy, and other subjects of a general liberal education. Indeed, the same is true, only in a less degree, so far as they teach the general principles, as well as the professional applications of the requisite sciences, mathematics, mechanics, chemistry, etc.

Every advance,—such as we are happy to note in some of our most thriving schools,—in the number or the elevation of the requirements for admission, is a step toward the complete remedy for both of the incongruities just described. Especially every collegian, well and profitably admitted to the third year of a polytechnic school, counts one toward making that school really and only a professional one, as it should be.

15. As to affiliation, a few of our polytechnic schools, as at Troy, Boston, Hoboken, or elsewhere, are independent; which seems to be the best way, if only for the very simple reason that the education which they give is a new beginning less than a century old, adapted to the new wants of the age, and therefore best not made a new patch on an old garment. Others are attached to institutions of the elder type, descendants of the early universities of Italy and Paris, and sometimes with the evident result that the new agreeth not with the old.

Such attached schools or departments would naturally be classed by practical managers, as to the rank and regulations of their members, with the college undergraduates of like age and maturity. But if their professional work is well developed, and vigorously conducted by teachers and students alike, working together with manly enthusiasm, these schools or departments should by all means be placed in all respects on the same footing as the other and older professional schools which cluster around the college as a nucleus. Thus we should have a healthy and natural manifestation of the old adapting itself to the requirements of the new.

16. Taking only a school of engineering for an example, in coming now more immediately to the composition of the course of study, we begin with two general remarks:

First, Some of the subjects of study are fundamental in such a

course, and others are secondary, though they would be primary in some other kind of technical school.

Second, In each department or chair of instruction, some of the subjects are general or theoretical, embracing the general principles of the science, constituting the departments; and others are applied, practical, or professional.

In an ideal polytechnic institution, instruction in all the general subjects of all the departments might be given in a central college of general science, along with the requisite literary culture; while the several leading specialties of the profession contemplated by the institution would cluster around this nucleus.

In such an institution as a whole, to which a few of our highest scientific institutions substantially tend to conform, and speaking as proposed only of engineering, the following departments are primary, or fundamental:

Mathematics; algebra, trigonometry, analytical geometry, and the calculus.

Mechanics; of solids and fluids; rational; physical, taking account in a general way of the properties of matter; and technical, as applied to structures, to fulfill prescribed conditions.

Physics; pneumatics, heat, light, etc.

Geodesy; topography and construction, or the measurement and representation of ground, with lectures on the *actual building* of works, designed in accordance with the principles of mechanics, for the measured and prepared ground.

Graphics, theoretical and practical, otherwise called descriptive geometry, stereotomy, and mechanical drawing.

Chemistry, geology, and natural history, however primary elsewhere, and intrinsically interesting and important, must of necessity be secondary in an engineering school, while language and literature should be quite superficial and supplementary; not because an engineer has no need of them, but because they should have been previously studied.

17. Mathematical graphics, its theoretical foundation being a comparatively new science, little attended to outside of polytechnic schools, seems to call for more detailed explanation.

There were scattered here and there, in the busy and fertile brains and stone sheds of the bold and skilled mediæval cathedral-builders, various ingenious conceptions and representations of complicated combinations of surfaces. Feeling their way along from generation

to generation, quite a body of constructive solid geometry of form and position was accumulated, but without scientific shape by means of an orderly development from first principles.

But Monge, the founder, in 1794.—and afterwards, by Bonaparte's appointment, the head of the celebrated polytechnic school of Paris,—originated, while at the engineering school of Mézières, in 1766 and onward, a new department of geometry, to which he gave the name of descriptive geometry. His power and capacity as a scientist are further indicated by his notable contribution to the advancement of the calculus,[1] his membership in the Academy of Sciences, his appointment to the Ministry of the Marine under Napoleon, etc. His testimony is, therefore, entitled to great weight, and is as follows, freely and briefly translated:

"If I were to rewrite my work on analysis (including the calculus) applied to geometry (a work in which the infinitesimal calculus has enabled me to discover and demonstrate many before unknown properties of curves and surfaces), I should write it in two columns. In the first I should give the demonstration by *analysis;* and in the second, I should give them by *descriptive geometry*,—in other words, by the method of projections; and, when finished, one would be surprised, in reading the work, to see that the advantage would nearly always be on the side of the second column, in clearness, simplicity, and in facility of application of the theorems to the various works of engineers."

Olivier, the founder of the Central School of Arts and Manufactures, Paris, and the most voluminous and indefatigable author on the subject, in four stout quartos has devoted himself, in his ingenious works, to illustrating the truth of the views of Monge. Leroy, and Gournerie, successive professors of descriptive geometry and its applications in the Paris Polytechnic School, and Martelet, professor of the same in the Central School just mentioned, have followed in the same line with ample quartos; but giving more attention to the science as a means of representing every conceivable form, and exhibiting its properties than to using the method of projections as a means of demonstrating properties otherwise discovered,

Many other works, French, English, and American, are elementary text-books, and mostly limited to the treatment of the science as a means of representations on planes of forms in space,—the attention paid to the subject in England and America not being such as to warrant the publication of larger works. I trust to be pardoned, however, for mentioning that, in my descriptive geometry of 1874, I

[1] Olivier. *Des Geom.* Part I. Preface.

attempted the experiment of giving a few examples in one single subject out of many (conic sections) of demonstrations of properties by the method of Olivier.

18. But it seems more independent to argue this question on its merits than by reference to authority and precedent. Let it be understood, then, that *form* and *number*, otherwise called *position* and *measure*, are the two main divisions of the entire field of geometry. The proposition that if the opposite sides of any hexagon inscribed in a circle, or any other conic section, be produced, they will meet in a straight line, belongs to the former division. The proposition that the area of the surface of a sphere is equal to the product of its diameter by the circumference of a great circle, belongs to the latter division.

Now, descriptive geometry deals immediately with relations of form and position; and whether it demonstrates such relations, or metrical ones, it does so by considering those of form and position, as shown in geometrically (not merely mechanically) exact representations on planes, which are therefore equivalent to the forms in space. And as Monge and Olivier both say (the latter in his *New Demonstration of the Principal Properties of the Conic Section*), and both wonderfully illustrating their opinions by their works, descriptive geometry, or the science of projections, furnishes a language of lines, in which geometrical truth may be written, as the language of analysis writes them in symbols.

It is, therefore, evident enough that a well-rounded training in geometry, whether in a course of liberal or professional education, should include descriptive geometry. Indeed, we may say that if analytical and descriptive geometry cannot both be taken, it might well be optional which should be chosen, in order that, at least among mathematical students in the aggregate, a knowledge of both might be represented.

19. When we turn from general mathematical students to those of engineering and architecture, the considerations are even more decisive. These persons can never be too familiar with geometrical forms and their exact representation on paper, in all modifications, positions, and combinations. This is what their profession constantly requires of them. It is also just what descriptive geometry directly aids them to become. Descriptive geometry, with its applications, is thus demonstrated to be fundamentally necessary to these professions.

In itself, it embraces planes in space; the many surfaces of which common cylinders and cones are a familiar example, and which can

be cut and unfolded on a plane; the many interesting or useful warped surfaces, as a screw-surface, which cannot be so unfolded; and the various surfaces of which the sphere is the simplest example, and which is curved in every direction. Numerous operations have to be performed with or upon all these, which, with the reasons and meaning of them, must all be well understood.

In its general and technical applications, it embraces shadow and perspective construction; the drawing of engineering works and machines, carpentry and stone-cutting, as far as to provide the guiding drawings and patterns for properly shaping the pieces of stairs, framings, arches, etc.; all the graphical part of practical Cinematics, or the shaping of gearing of every kind, so that it shall produce the intended motions,—and finally, dialling, and spherical projections, or the geometrical part of the quite extended subject of scientific geographical map drawing; besides the elegant and useful *specialties* of isometrical and axonometric projections, and the "one plane descriptive" which is principally applied in the drawing of fortifications and military maps.

Any new design, as the "Monitor" and its machinery, the East River Bridge, a public building, or a mountain locomotive, and a thousand lesser things, exists at first only in the mind of the designer, as truly as *Ivanhoe* first existed only in the mind of Scott, or the *Rise of the Dutch Republic* in the brain of Motley. In both cases alike, the original conception can be made intelligible to others only through some kind of language. Now, mathematical drawing is the language of design. The system of projections is its alphabet, and descriptive geometry is its grammar and reader.

Written in the language o projections, the thought of the designer or inventor can be read by the builder or workman, and by them translated into wood, stone, and iron, for the eyes and use of the world. Enough. We all see it. Then we will pass to the next point.

20. This simple exhibition of the scope of descriptive geometry and its applications, which might be indefinitely expanded by going more and more into particulars, is of itself enough to show, not only, as before urged, that this department is properly one of the fundamental ones in an engineering school; but that it is abundant, in the case of any well-developed and well-proportioned engineering course, to occupy the entire time of one professor, with assistants proportioned to the number of students.

Just here, also, it should be observed that a principal reason for the limited development of the subject in text-books on descriptive

geometry written in English, as compared with the larger French ones, is the time given in our technical schools to the elementary preliminaries and accessories of the department, which should be required for admission. These elementary subjects are plane geometrical problems, elementary operations with drafting instruments and materials (drafting manipulation), and elementary projection and perspective drawing.

Also, just here, those who wish to be honestly served should be informed that it is easily possible to fill great wall-space at exhibitions, with showy work on a large scale, which may, nevertheless, all be based on a very few and elementary principles, while work which is much less attractive to the eye may represent much previous hard study; in other words, may mean a great deal more.

But, besides this evidence, from the nature of the case, that descriptive geometry and its applications furnishes abundant materials for a full professorship in any and every high-class professional school of engineering and architecture, there is abundant precedent for this arrangement where such schools have existed longest, and are best known and appreciated; viz., on the continent of Europe; in France, Germany, Austria, Switzerland, Russia, and even Sweden, as shown in general by published programmes, and other sources of information, obtainable without special difficulty by those interested, and at any time within the last thirty years or more.

In particular, there is such precedent in the very strong comprehensive Polytechnic School at Zurich, in Switzerland;[1] in the Central School of Architecture, at Paris,—where, indeed, the subject is divided between two professors, although a considerable amount of elementary descriptive geometry is required for admission;[2] in the Central School of Arts and Manufactures at Paris, course three years, and where also as much descriptive geometry appears to be required for admission as is taught in some schools; in the Polytechnic School of Munich; in the Technical Academy at Berlin; in the Polytechnic Schools of Carlsruhe and Dresden, and elsewhere.

There is, however, little or nothing of English precedent to quote here. Excepting the work of a few leaders, often of other than purely English antecedents, everything must be subservient to what are called British interests, which means practically the worship of gold, power, and caste,—the national idols of that too much and too often prevailing element in England which all the world knows as John Bull, who proposes to rule everybody and be ruled by nobody, and

[1] *Technical Education for the English People*, by J. Scott Russell, p. 145.

[2] Published conditions for admission for 1866.

who will send missionaries, or do anything else for you, if you will only do exactly as he says,—as witness the Chinese and all who cannot effectually resist, as the Afghans so nobly did twice within the last half century.

Beginning, less than fifty years ago, with the insulting pittance of twenty thousand pounds a year for national education,—and even this was stoutly resisted,—the increase of that sum up to the present four millions a year has been fought for inch by inch. There is to-day; except three or four government institutions, hardly a higher technical school in the kingdom. Scott Russell, in his high-souled work, *Technical Education for the English People*, launched his generous enthusiasm with the energy of despair against the stolid apathy of his countrymen (now fourteen years ago); urging (p. 436) that the Commons should "vote funds for cultivating the people of our own nation, which shall bear some fair proportion to the sums voted for killing the people of other nations;" and complaining (pp. 172 and 306) that while the annual interest on the cost of past wars is twenty-five million pounds, and the annual cost of preparation for future ones is another twenty-five millions, and of paupers and prisoners seven millions more,—one million for education is grudged; and piteously asking (p. 390) why class schools founded only on money distinctions should be followed up by different buildings, schools, or seats at college,—one for the son of the so-called great, and another for the poor scholar of capacity and promise; and lamenting (pp. 140–42) the languishing condition of the very few technical schools which were founded by persons of other than English antecedents, or by the rare few who were in advance of their countrymen; also (p. 25), that Germany has six technical universities, while England had none; and, once more (p. 306), that, so late as 1868, it could be said, that "the contrast between England and Switzerland isthis: that England spends more than five times as much on pauperism and crime as she does on education; and that Switzerland spends seven times as much on education as on pauperism and crime." We may add that, in Norway and Sweden, the almost universal land ownership, and the absence of the folly of caste, conspire powerfully with universal education, to make pauperism and crime comparatively unknown. [1]

Still, in view of the well-known disposition of the English to "make haste slowly," and for fear of doing injustice, we may also add, that the growing enlightenment, under which the twenty thousand pounds of 1834 has grown to the probable five million pounds of to-day, for

[1] *Land of the Midnight Sun.* Du Chaillu.

national education, may be trusted to work out the problem of English technical education, if not exactly by the Continental method. Indeed, returning for a moment to Scott Russell, he admits (p. 138) that every kind of knowledge is to be had in England somehow and somewhere; and that "the man who can help himself always gets help;" but still he complains that extreme notions on the subjects of perpetuated class distinctions and of personal freedom prevent a proper degree of comprehensive graded organization, so that opportunity shall be conveniently placed before everybody.

The thoughtful and generous progressives, McCarthy[1] and Mackenzie,[2] similarly deprecate selfish aristocratic conservatism, and the stupid pride which scorns everything which it calls "un-English," as if to be that were, of course, to be inferior, superfluous, or bad. Moreover, what of popular educational progress has been made in behalf of man as man, as my brother and God's child, has largely been secured by "un-English" men, Forster, the son of a Quaker philanthropist; Gladstone, who, as well as Scott Russell, is Scotch; Prince Albert, who was German, and others.

But, dropping this digression, which may, however, well help to perpetuate, in a wholesome degree, "the spirit of '76," we think we have now sufficiently supported our main points: that the best polytechnic school should aim to provide but one comprehensive professional course; that it should free itself from preparatory and collegiate work, and only undertake professional work; that it is better to be independent of institutions of a different, though in no sense antagonistic type; that its graphical work, theoretical and practical, is one of its fundamental departments; and that this department affords abundant material, even when excluding its more elementary portions, for a full professorship.

[1] *History of our own Times.* [2] *The Nineteenth Century.*

THE EDUCATION OF THE INDIAN.

BY CHARLES F. THWING.

That is a bright page in the usually black history of the relations of the white man to the red, which tells of the attempt of the early settlers of New England to establish an Indian college. The Puritans of Massachusetts Bay, who founded Harvard, made a systematic attempt to extend the benefits of a liberal education to the aborigines. Instruction in Latin, Greek, and English was provided. Several of them, it is probable, entered the college, but only one ever became a graduate. Some students, after making good progress, abandoned their studies for a more congenial life in the forest. Others, who persevered, fell victims to that disease to which the Indian, when introduced to civilization, seems to bepeculiarly subject,—consumption. "Caleb Cheeshahteaumuck, Indus," now stands alone on the pages of the *Quinquennial* to represent the native tribes.[1]

That, also, is a bright page in the history of the Indian which, in the middle of the eighteenth century, describes the mission of Jonathan Edwards to the tribe dwelling at Stockbridge. Though the mission was not successful, the plans respecting it were wise. A house for a boarding-school was erected. Generous subscriptions toward the support were made in England and in the colonies. In addition to the rudiments of learning, the boys were taught farming and mechanic arts, and the girls "all sorts of women's work." Mr. Hollis, a name most intimately associated with the early history of our oldest college, "ordered twenty-four Indian children to be educated on the same footing, wholly at his cost."[2]

Despite, however, these instances, it is not till recent years that any comprehensive and systematic endeavor has been made to educate the Indian. The difficulties in the way of his education are the difficulties in the way of his civilization. These are many, diverse, and great. They arise, in general, from a state of savagery. I have heard a missionary to the Zulus speak of his delight when a native came to the station and asked for a *shirt*. The request showed that his mind was awake and progressing. But it indicates certainly a

[1] *Quincy's History of Harvard University*, i. 191, 192. *Mass. Hist. Coll.*, First Series i. 172.

[2] *Life of President Edwards*, prefixed to his works, chapter v. sec. 1.

much greater advance for "Bear Ghost" or "Talking Crow" to come to an American Indian agent and ask for a book. The Indian loves hunting, the school interferes with the chase. The Indian loves roving, the school demands confinement. The Indian loves idleness, the school requires work. The Indian loves exhibitions of physical force, the school emphasizes ideas. The Indian loves change, the school necessitates permanence. The Indian seeks immediate results, the aim of the school is distant. The school offers what the Indian in his native state neither desires nor has the ability to appreciate in its full degree. But, besides these difficulties, inherent in the red man himself, other obstructions beset. It is not easy to secure suitable persons to establish and to teach schools for Indian youth. Life at an Indian agency, or among a tribe, isolated from society, dwelling on the prairie or in the forest, is anything but attractive. The compensation provided is frequently the merest pittance. The tenure of office, even if the teacher desires to continue to hold his position, is not permanent. His official superiors are not in many cases fitted to understand the worth or the importance of his work, and therefore either fail to coöperate, or place direct impediments in the way of its success.

Yet it is plain that the Indian, as now circumstanced in this land, desires to secure the education of his children. With one exception, the agents, in their reports for 1880 unite in the assertion that the establishment of schools is favored by the red man. The agent at Pine Ridge, Dakota, writes, "There is a strong desire on the part of the Indians to send their children to school."[1]

Mr. P. B. Hunt, of the Kiowa, Comanche, and Wichita agency, Indian Territory, affirms that "the parents have shown an interest in the school, and have manifested an anxiety to have their children brought up in the white man's ways." The agent of the Flatheads, of Montana, reports, in 1880, that "a few years ago it was a most difficult matter to induce an Indian to allow his boys to be confined to a school-room; but a wonderful change has taken place, and the number of applicants . . . . far exceeds the appropriation for feeding, clothing, and taking care of them."[2]

The following letters, received by General Armstrong, of the school at Hampton, illustrate the interest taken by Indian parents in the improvement of their children. The naturalness of their style is quite as charming as their contents are gratifying. An Indian father writes:

[1] *Report of the Commissioner on Indian Affairs*, 1880; 40. *Ibid.*, 75. [2] *Ibid.*, 110.

"CROW CREEK AGENCY, January 14, 1879.

"MY SON: I am going to write you a letter again. I want you to write letters to me often. I am glad that you are trying to learn. Don't run away from the school. It will be your own good if you learn. Do all the work they tell you to do, and learn to be a carpenter and a blacksmith. I would like to see how the Indian boys learn. The boys down there, their fathers would like to go down and see them. Then they would come back and tell the other Indians. Then they would like to send all their children. Learn to talk English; don't be ashamed to talk it."

Another father writes from Fort Pierre, Dakota:

"I want you to learn how to be a printer. I want you to learn to talk English. I would like to have you learn how to be a carpenter. I would like to go down there and see how you are getting along. If I was down there,—if I saw all the boys down there, then I would come back and tell the Indians, and they would all be glad. I hope some of the boys will learn to be a teacher, when they come back that they can teach the boys and girls. This is the only chance you have; get all the good you can. This is all I have to say."

From an Indian mother:

"KESHENA, WIS.

"I am sorry you are not coming home next summer, dear child, but if you like to learn something it is a good place for you. Learn all you can; it will be for your own benefit.

Your affectionate mother, WANHANNO KIEIR,"

A father writes from the same place:

"Try to learn fast and study hard, so that you will be a smart man. Try to learn the trade of blacksmithing."

Schools for the Indian youth admit of various kinds of classification. In respect to their support and superintendency, they are either governmental, as organized and supported by the National Government, or missionary, as being under the direct charge of missionary societies. In respect to their method, they are either boarding-schools, in which the pupils are entirely separate from their home, or day-schools, in which the pupils study and write for a few hours each day, still remaining members of their households.

The Government has three classes of funds from which schools can be supported:

"(1). Appropriations made in fulfillment of treaty provisions which pledge either the payment annually of a specific amount for education or the support of specified schools.

"(2). Appropriations made solely for education, but made as a gratuity, and not under treaty.

[1] *Annual Report of Indian Commissioner*, 1882; xxxix.

"(3). Appropriations made for general civilizing purposes, either in fulfillment of treaty obligations or as a gratuity."[1]

From these three sources four hundred and eleven thousand dollars were, in 1882, devoted to Indian education. Slightly more than one half of this amount was derived from funds appropriated to the general purpose of civilization. One hundred and thirty-five thousand dollars was the amount of special appropriation for education. It is interesting to note that, in the last six years, the amount devoted to this most important object has more than doubled. In 1877 it was one hundred and sixty-eight thousand dollars; in 1878 it was increased to one hundred and eighty-eight thousand dollars; in 1879 it rose to one hundred and ninety thousand; in 1880 it leaped to two hundred and ninety thousand; in 1881, it sprang up to three hundred and seventy-nine thousand; and in 1882 it aggregated four hundred and eleven thousand.[1] The increase indicates a policy wiser and more humane on the part of the Government than has usually characterized its action. The amount expended by the Government exceeds about twofold that expended by the various religious societies. In 1882 the total sum devoted to schools and missions by these societies was two hundred and sixteen thousand six hundred and eighty dollars.

Among the quarter of a million of Indians in the United States are not less than forty-five thousand youth who should be educated. In the last year less than nine thousand, less than one-fifth, were en-

[1] *Ibid.*, xl.

	1877.	1878.	1879.	1880.	1881.	1882.
Appropriations made in fulfillment of treaty provisions which pledge either specific sums for education or the support of specified schools, . . .	$78,422	$81,056	$76,082	$75,950	$57,450	$52,627
Expenditures for schools made from general funds appropriated or held in trust for the support and civilization of Indians, . .	66,377	72,428	45,490	49,030	122,448	116,292
Special appropriations made for education, .	20,000	30,000	64,000	75,000	75,000	135,000
Expended from civilization fund for reservation schools, . .	3,885	5,135	1,984	25,228	36,606	16,901
Expended from civilization fund for schools at Hampton, Carlisle, and Forest Grove, .	. . .	. . .	2,669	26,992	65,748	89,104
Expended from Sioux fund for Carlisle school,	. . .	. . .	. . .	38,263	22,036	1,614
Total . . .	$168,684	$188,619	$190,225	$290,463	$379,288	$411,538

rolled as pupils in the Government schools, and the average attendance was slightly more than one-half of the actual enrollment.[1] Although the gain in attendance in the last six years is considerable, yet it is still true that more than four-fifths of the Indian youth are growing up in total ignorance. According to the last Census, nine and four-tenths per cent. of the white persons in the United States ten years old and upward cannot write; and of the colored persons of the same age seventy per cent;[2] but it is probable that more than eighty per cent. of the red men can neither read nor write.

The education which is afforded is mainly industrial. It is as much, or more an education for the eye and for the hand than for the intellect. It is concerned more with doing than being, more with economy of living than gaining culture. The rudiments of learning are taught, and advance is often made into higher studies. The use of the English language is the first and immediate aim. Reading, spelling, writing, and geography compose the principal subjects of study. But it is more important for the Indian boy to be taught to make a harness than to make a correct English sentence; it is more important for the Indian girl to be taught to make a dress than an accurate map of the State of Massachusetts. Whenever it is possible, therefore, the boys are obliged to learn some trade, and the girls some form, or all forms, of domestic work. The day-schools at the agencies are not adapted to furnish industrial training, but the boarding-schools are well fitted to develop mechanical skill. In these schools, also, most favorable opportunities are afforded for moral and religious instruction.

The training-schools established at Hampton, Virginia, and at Carlisle, Pennsylvania, have justly become famous by reason of the work which, within the last five years, they have accomplished for the Indian youth under their charge.[3] In 1880 a similar school was organized in Forest Grove, Oregon. The purpose and method of each are similar. The general aim is to civilize; and the general method is to teach the pupil to use his faculties of body and of mind in the gaining of a livelihood. The pupils, numbering the last year

[1] *Ibid.*, xxxiii.

	Number of Pupils.	Average Attendance.
1877,	6,019	3,598
1878,	6,229	4,142
1879,	7,193	4,488
1880,	7,240	4,651
1881,	8,109	4,976
1882,	8,412	5,126

[2] *Census Bulletin*, No. 303.

[3] The School at Hampton also contains colored students.

four hundred and seventy-six, study much, but work with their hands more. The larger part work on the farm, and so learn agriculture; but there are apprentices to the trade of carpenter, printer, blacksmith, tinsmith, shoemaker, butcher, wheelwright, painter, saddler, tailor, and baker, — to the number, in 1882, of one hundred and eighty-three. Removed from association with their tribes, devoting all their time and energy to the purpose for which they were received into the school, surrounded by all possible means to insure progress in the training of the hand, of the mind, and of the soul, they develop towards, even if not into, a civilized state.

The same industrial training, though afforded under conditions less favorable, is given in the boarding-schools on the reservations. Fifty seven of such schools were in operation last year. In all, the teaching of agriculture is emphasized; and in many the trade of the carpenter, of the shoemaker, of the harness-maker, of the tailor, and of the blacksmith can be learned.

The advance which the young Indians make in learning appears to be quite as rapid as can be expected. Their faculties seem alert and vigorous. "I think," writes an agent from Arizona, "from actual observation, they will compare favorably, in intellectual appearance and brightness, with those who have been more highly favored." An agent of the Indian Territory affirms, remarking of the industrial schools, that "the progress made and results attained have exceeded the most sanguine expectations." Lieutenant Pratt, in charge of the Carlisle school, reports, in 1880, that "the progress in our schoolroom work is most gratifying. It is not too much to say that these Indian children have advanced as well as other children would have done in the same period. They have been especially forward in arithmetic and in writing."

Yet, despite natural aptitude and the advantage of the school, the Indian remains half-savage. He is still uncivilized, save as he is touched by the evils of civilized society. He is lazy, dirty in personal habit, nomadic, improvident, loving whisky, thievish, irresponsible, revengeful, respecting only a superior force. Doubtless, not a few of his evil characteristics he has learned entirely from the white man who sells him "fire-water;" doubtless, also, not a few of his characteristics, evil by nature, have been more deeply impressed by the white man, who debauches his wife and his daughter. The Indian has suffered wrongs of every sort,—wrongs of the basest iniquity. In his tribe civilization, therefore, makes slow progress. Yet progress is made, and before the last of the race disappears from the Continent over which he once roamed master, there is reason to hope he

may become the equal in all the arts of living of his white conqueror.

For the gaining of this general purpose of civilization, it is plain that the school is an important factor. And for increasing this power of education, it is also plain that the schools should be made far more effective. Schools similar to those at Hampton, Carlisle, and Forest Grove, removed from the Indian country, should be established, to the number of a score. Additional boarding-schools should be formed on the reservations. Schools similar to the district school should be organized throughout Indian settlements. Attendance upon them should be made, as has been attempted at a few (and only a few) agencies, compulsory. In these district schools, the women graduates of Hampton and Carlisle, who on returning home are liable also to return to their former mode of life, can be employed with advantage to the teacher and to the pupil. All these schools should be furnished with the best equipment of buildings, apparatus. and, above all else, of thoroughly qualified teachers.

For the more speedy and thorough civilization of the Indian, the government, through its schools, should coöperate with the various religious societies in their missionary operations. These societies have missions among all the tribes. The Methodists, the Roman Catholics, the Baptists, the Congregationalists, the Presbyterians, the Protestant Episcopalians, and other denominations, support various stations in the States and Territories west of the Mississippi, as well as among tribes east of the river. Their aim is religious. Their schools and other agencies are subsidiary to the purpose of the conversion of the red man to Christianity. But it is ever to be remembered that Christian teachings and Christian influences are the most efficient instruments in the civilization of savage races. The Government does not teach the Indian Christianity. Such instruction may lie beyond its sphere. But the Government does aim to civilize the Indian. Therefore, unable of itself to use the instrument most effective in establishing civilization, it should coöperate with the various religious organizations in their missionary work. Upon this point the opinion of Commissioner Price, in his Report for 1882, deserves quoting, and commands our thought:

"I am decidedly of the opinion that a liberal encouragement by the government to all religious denominations to extend their educational and missionary operations among the Indians would be of immense benefit. I find that during the year there has been expended in cash by the different religious societies for regular educational and missionary purposes among the Indians the sum of $216,680, and doubtless much more, which was not reported through the regular channels,

This is just so much money saved to the government, which is an item of some importance, but insignificant in comparison with the healthy influences created by the men and women who have gone among the Indians, not for personal pecuniary benefit, but for the higher and nobler purpose of helping these untutored and uncivilized people to a higher plane of existence. In no other manner and by no other means, in my judgment, can our Indian population be so speedily and permanently reclaimed from barbarism, idolatry, and savage life, as by the educational and missionary operations of the Christian people of our country. This kind of teaching will educate them to be sober, industrious, self-reliant, and to respect the rights of others; and my deliberate opinion is, that it is not only the interest but the duty of the government to aid and encourage these efforts in the most liberal manner. No money spent for the civilization of the Indian will return a better dividend than that spent in this way. In urging this point I do not wish to be understood as claiming that all the good people are inside the churches and all the bad ones outside; but a little observation, I think, will convince any one that a very large proportion of those who sacrifice time and money for the good of others is found inside of some Christian organization. If we expect to stop sun dances, snake worship, and other debasing forms of superstition and idolatry among Indians, we must teach them some better way. This, with liberal appropriations by the Government for the establishment of industrial schools, where the thousands of Indian children now roaming wild shall be taught to speak the English language and earn their own living, will accomplish what is so much desired, to wit, the conversion of the wild, roving Indian into an industrious, peaceable, and law-abiding citizen."

The question of the education of the Indian is, as has been suggested, closely related to the question of his civilization. Although education is a constant factor in our civilization, yet the peril in the case of the Indian is, that the educated Indian returning to his half-savage tribe, finding no occasion for employing his knowledge of making boots or manufacturing tin-ware, will relapse into the state whence he was taken, and in which his tribe has ever remained. It would, therefore, appear to be the duty of the Government not only to educate the young Indian for three years or five, but so to provide him with the opportunities for using his education that it may still be retained and made of constantly increasing service. These opportunities may be gained by treating the Indians, — not as paupers, feeding them at the public crib of annual appropriations from the United States Treasury, but by encouraging them to cultivate their soil, which they should hold in individual ownership, to raise cattle for market, and to buy and sell the various kinds of goods which they either produce or demand. We may indeed, to a degree, civilize the Indian by educating him, but we should also use every other means of civilization, that the education itself may prove to be of worth most substantial and permanent.

STATE AND SCHOOL: THE FOUNDATION PRINCIPLE OF EDUCATION BY THE STATE.

HON. SAMUEL BARNETT, WASHINGTON, GA.

THAT some close and important relation exists between the state and the school is obvious upon the most superficial observation.

Compare an educated people with an uneducated; it is to compare knowledge with ignorance, strength with weakness, civilization with savagery; in extreme cases, almost the man with the brute. Again, in the same state, say in Great Britain, compare the educated with the uneducated classes. Think of their homes, their pursuits, their pleasures, their very faces and expressions. Recall the intelligent faces and bright eyes around the evening fireside of a well-trained family, and the brute faces about a prize-fight.

Why is all this? What makes the difference? Very largely the modifying influence of the school. The school stands as a friendly border-land betwixt the state and a savage foe: if the school fail to encounter the infant hydra, the state must encounter the monster in its full growth. Nay, the enemy is within the very bowels of the state: in every household there are incipient foes. A constant influx of new life comes into the state, which needs to be moulded by the school while still plastic. The little savage of rapid growth — the *enfant terrible* — is by education to be converted into a citizen, peaceful and useful, or else grow up into an adult savage.

The work must be early and timely; it brooks no delay. Says Lord Bacon, "Commonwealths and good governments *do nourish virtue grown*, but do not much mend the seeds." These views show the importance of education, but do not indicate by what agency it is to be given.

We shall pursue the discussion under three heads, — The School, The State, and their Mutual Relations.

I. THE SCHOOL.

Let us endeavor to grasp the exact object of the school, its central function, — what Coleridge would call its *idea*. Manifold as is education and varied the aspects in which we may regard it, its central idea, to which all others are subordinate, is easily expressed.

Knowledge

Any large growth of knowledge is characteristic of humanity alone; no other creature is capable of it. The state itself would not exist without it. But is not *discipline* rather than *knowledge* the central idea of the school? Discipline is included in knowledge; it is in a large sense self-knowledge applied, — knowledge being truth in possession, virtue truth in action.

Exceedingly close are the relations betwixt knowledge and the state, knowledge being eminently social in its origin and growth. Animal progress is individual, and so extremely limited; human progress social and almost limitless. Its great instrument is

Language.

By means of language men exchange ideas; in this exchange there is a paradox, for, at the close of a mental exchange, *both parties have both ideas*, and, by the very necessity of stating them in words, both ideas in improved condition. Hence by mental exchanges, there being no loss but all gain, there arises a vast accumulation of ideas.

Another paradox: this common stock of knowledge, more miraculous than the widow's cruse, *grows by consumption.* Consumption itself is production in the world of thought. Such wonderful advantages attend mental wealth and mental exchanges. Language itself is twofold, — spoken and written (or printed). The spoken word quickly perishes; writing fixes it, print multiplies it. The vast accumulated stock of ideas and experience is stored in books.

To the great storehouses of knowledge education is the key. We pity the deaf and dumb, who have not the use of language: we build asylums for them. But the treasury of knowledge is chiefly in books; so that in a most intense and practical sense *the illiterate are deaf and dumb.* To educate them were indeed a charity. Is it no more? The absolute necessity of education is growing with every advance of civilization.

Whence is this indispensable education to come? First, it must come *from without.* This little red colored infant cannot educate himself, — most helpless of all creatures, unfit even for contact with nature.

From the family? Yes, naturally, largely, as far as possible. But mere parenthood does not qualify for the work of education: many parents can ill spare even the labor of the children.

Consider here a fundamental truth: the greater the need, the less

the capacity to bestow education. This is true not of the family only, but also of the poorer sections and poorer classes. Need and ability stand in inverse ratio.

Voluntary association should do its full work, — strain every agency, and to all others add private charity, as illustrated by the noble benefactions of Peabody and such lovers of their kind. We bid them God speed, and thank them in the name of humanity.

But, after exhausting in their order all other resources, — self-help, the family, denominational enterprise, private charity, and all else, — still education, even in this age and in the most advanced countries, is nowhere upon a satisfactory basis of universality and efficiency, so that one can say it has done its utmost work for mankind. And, perhaps, we may add (amidst the growing complexities of civilization), that in this specific direction, in this utmost work of education, lie the dearest hopes and highest interests of humanity.

We need adequate resources for the very chiefest uses. Even with state aid, the consummation is distant and difficult; without it, whole generations will pass away before the present tardy processes reach the masses even of civilized mankind.

In the order of nature, indeed, the chief business of each generation would seem to be to educate the next; unless this duty is fulfilled, social degradation and decay necessarily follow. This leads us to our second head.

II. The State.

The central idea of the state is undoubtedly

Justice.

Justice, itself the central virtue, rendering to each his own, — to God, to Cæsar, to fellow-man, — is the centre. But what are the outer limits? Concerning these, there are wide differences of opinion.

What is the province of the state? No question was ever more mooted or ever more profoundly considered than at present; especially the relations of the state to education, far transcending all local and temporary issues, are pressing everywhere, even now, not only for decision but for action.

Federal and State.

The present aspect of the controversy is highly favorable, both on principle and authority. Indeed the battle is won: it remains to secure the fruits of victory and wisely to administer the duties consequent thereupon.

The weight of authority is overwhelming, embracing all but one school of thought, and dividing even that one, limited, yet able, school.

Both of the parties in interest are agreed, statesmen and educators In the United States, the Presidents, earlier and later, including Mr. Jefferson, the head and front of close construction, all vote "aye." So the governors of the States; and what is more, the constitutions of the States.

As with states, so with all the civilized countries, one by one, on the Continent, and in conservative Britain, now strongly committed to the doctrine in all her vast domains, increasing government provision has been made for education.

Mankind seems to have become everywhere awake to this great instrumentality, and recent advances have been made, wholly unprecedented, along the whole line.

Independent, disinterested thinkers are also almost unanimous. Time would fail to enumerate the publicists and political economists, the students of government and law, who concur. But it is useless to dwell longer on authority sustained by practical action and vindicated by results.

There is, however, a single school of close constructionists, powerful in name and argument, which opposes state aid to education in any form, represented in sociology by Mr. Herbert Spencer and by Bastiat in political economy, — a school which limits government strictly to the administration of justice, a school whose opinions and arguments are worthy of great respect and close consideration.

Not all even of the close-construction school, however, exclude education from the legitimate province of government. Mill, one of the most jealous of restrictionists, the author of the Essay on Liberty, includes education, and argues it with his usual ability.

Indeed, this restrictive view is my own standpoint. The subject was approached years ago from the point of view of a strict constructionist of the powers of government, ever inclined to suspect it, disposed to limit its province, and believing its usual vice to be excess.

The arguments of the restrictive school are well known, but have not convinced either the parties or the judges, either statesmen or educators or political economists, — such men as Mr. Gladstone, Huxley, and Fawcett.

Indeed, never before was there such growth of conviction or such practical action as since the promulgation of the adverse arguments. Thus the weight of authority is not only unshaken, but strengthened

by the attack. Fully to discuss the conflicting views of government would consume our whole time. We shall only attempt to present what we regard the true view, which recognizes government as a social agency, of which the test is

Adaptation.

Fitness for the end in view furnishes the criterion as well for government as for any other agency.

To what, as an end, must government be adapted? To freedom, to the highest liberty of all. Its consummation would be the maximum use of one's own powers, — what has been called the *pleroma* or fulness of life in every citizen. This fulness of life is attained by (1) the utmost increase of power, and (2) the utmost diminution of resistance.

The state does not directly increase force; education, however, does, for knowledge is power, making nature subservient to man.

But the diminution of resistance effected both by the state and the school is enormous, by the removal of antagonisms. Conflicting forces are made parallel, especially social forces. Nothing so hinders a man as the opposition of another man. His human foe most shrewdly hurts, his human friend most wisely helps, him.

Unless government stands sentinel for us, all our time and pains are occupied in mere self-protection; we have no time for industry.

Without education, on the other hand, we have little skill for it. So do state and school work hand in hand toward like ends.

We come now to our last head.

III. The Relation of the State to Education.

This relation is that foundation principle which is the direct object of our search.

As we determined the central function of the school and of the state, let us now find the central idea also of what we mean by a foundation principle.

Is charity such a principle, or pity, or mercy? Alas, we fear not. These may be buttresses at the side; but in human affairs they are not the central idea of such a basis as we seek. *Interest* alone can supply that basis.

The foundation principle of education by the state is *mutual interest* founded on mutual service.

In the relations of state and school, the work of each is necessary to the other, and each is best qualified for its own share of the work. That of the school is preparatory and essential to the welfare of the state; the state is equally essential to the school. Justice must first be established before so peaceful an institution can prosper. The services are mutually complementary, and each does its part at a great relative advantage. The relation has considerable analogy to marriage, the state performing the sterner, harder, and more exterior duties and using force; the school, the gentler domestic duties, using reason and kindness. To develop the subject more accurately we present a general view in a few formulated theses.

Theses.

1. State and school are both institutions of a common principal, society.

2. In the preparation of men for the social state, the school is a necessary agency; with advancing civilization, this necessity constantly increases.

3. The interest of the state in this preparation is too profound to be left to chance; indeed, no legislation so involves the highest interests of society and of the state as that which concerns the education of the people.

4. While the state should avail itself of all auxiliaries, it must at its peril see to it that the work of its servant and ally, the school, is timely and properly done. It is under a *subpœna*, — "Herein fail not under a great penalty."

5. Education subserves the purposes not only of the best distributed justice, but of the most enlightened policy, and at the same time the harmonizing ends of the most tender mercy, the most melting pity, the most loving charity; and all these without their usual accompanying enervating influences.

6. Education is the profoundest security of the state within and without, the basis of wealth and strength, the chief means of prosperity and of recuperation from adversity.

An enlightened people is the only safety, the only solid bottom of national prosperity; and this is true *a fortiori* in a popular government.

7. While no wild, indefinite enlargement of the powers of government is to be favored, the study of the subject will induce a more and more profound conviction of the *fundamental character of knowledge in its relations to government as to all things else;* and especially

of the very near and intimate relations of knowledge to justice and liberty, — the great ends of government.

8. Admitting the importance of properly limiting the powers of the state, education supplies the best means of effecting such limitation. Among its numerous and incalculable benefits this is but one, yet one of inestimable importance; therefore, the powerful guns of strict construction may be captured and reversed; for

9. Maximum education gives maximum liberty, permits minimum government.

Knowledge on the part of the people governed, the principal, is the best and only security against their agents, the rulers.

The inclusion of knowledge is the exclusion of all that is wrong and the strengthening of all that is good in government. Usurpations and abuses seek darkness, they shun the light. Knowledge is as essential to self-protection against government as against any other power. Knowledge is ever associated with liberty, ignorance with despotism. There is no safety short of an intelligent criticism on the action of government. But for knowledge we should have no strict-construction critics to tell us of its excesses.

10. With an enlightened people the powers of government may to some extent be innocently extended, for with growing checks growing powers are possible.

11. An enlightened people is the best constitution of a state.

The central ideas of school and state, respectively, are knowledge and justice. Now the relations between knowledge and justice are wonderfully close. In the animal world there is scarcely any sense of justice, and little of it among savages: knowledge is a necessary foundation for it.

Knowledge prepares man for life, justice for social life. Education is the art of living, government the means of living together. The objects are almost the same. Knowledge and justice kiss each other. The methods of the state and the school differ; but the ends are the same. That of the school is superior, however, and most to be encouraged, for the state disciplines by force, the school by reason. The state governs from without, the school from within. Government from within reduces the need of government from without. Says Coleridge, "The necessity for external government to man is in inverse ratio to the vigor of his self-government."

The favored agency should be peace, not war; gentleness, not force; reason, not constraint. All these views are true and sound, regarding the state as a mere aggregate of individuals. But the argument is intensified beyond measure when we regard society in

its true view, as an organism. The social organism is no mere figure of speech, it is a wonderful fact, full of important consequences.

We quote a powerful passage from a recent paper of Dr. Wm. T. Harris:—

"As individual, John or James, each has a self — an ego, but a self hemmed in by limitations. In the organic form of institutions, man becomes a series of giant selves, each formed in the general image of man, and having its head, its hands, its deliberative power, and its will power to execute with. As such vast organism, man becomes infinite in respect to many points wherein the single individual is finite."

"In the family, the inequalities of infancy, youth, maturity, and old age are mediated and balanced, so that the infant lives a rational life in full view of his destiny, the febleness of old age is provided for, the sick are cared for by the well, etc.

"In industry, the lack of skill in one is annulled by the division of labor, and each one acquires the maximum of skill by the minimum of variety in the use of brain and muscle."

"In the state, we find still greater results achieved. The nation never sleeps, never ceases to watch, think, act, provide, produce. Without the state, the social elements are all exposed under the cruel open sky; the roof of the state must first be raised before the other social elements can be protected."

The highest of all organisms is society, each element of which is itself a complex organism, a sociological unit, capable of manifold combinations. Vital forces are developed, — warmth, mutual sympathy, mutual action, and reaction; the effects of such interactions are marvellous, — even new social creatures. An educated state is such a new creature. What knows the savage of the daily life of civilization? of the morning paper, the evening book, the works of art, the sciences of nature and of life, the railroad and telegraph, foreign commerce, bills of exchange, the complex machinery of modern life? What thinks he of the great banking systems, the great transportation systems, the universities and libraries, the interdependent and related industries? For all these developments successive assimilations prepare the way. Even in the less complex organisms minerals are first assimilated by vegetables, these in their turn by grain-eaters, then by meat-eaters. The humble earthworm contributes no small share to the elaborate result.

The social organism being the highest, the children born into society are the blood thereof, which is the life thereof, each child an atom in the family molecule, which powerfully shapes and modifies it. The school next exerts its assimilating power, deals with the young and tender thing, too weak as yet for the giant hug of society, with its fierce and hard competitions. The school is an essential factor; the child trained at home alone is a hot-house plant left un-

trained, — a foreign substance in the body politic, raw, indigestible, to be endured or eliminated as may be cheapest.

States are reaching even now the nascent, self-conscious state. The precept, "*Gnothi-Seauton*," is applicable in its fullest sense to this huge organism. Sociology, as a science, has just dawned upon us, full of promise of high results, to be worked out jointly by men of action and men of thought. The men of thought must still take the lead, as Adam Smith, Spencer, Bastiat. A grand work for the state remains to be done, based on knowledge of the laws of state development. New problems are ever arising. Needed now, a Froebel of social laws, a Pestalozzi of the nations.

And now as to results. Accepting the most limited principle as to the province of government, viz.,

The Administration of Justice,

We see that education falls clearly even within it. Preventive not punitive justice. The object of that administration is the protection of person and property against foes, foreign and domestic. Applying this principle systematically by the tests of adaptation, proportion, economy, and all appropriate rules, we say that, for a given expenditure in education, both the people and the state, as such, will reap better and better distributed protection than by any other known form of expenditure ; that the results will not only be remunerative, but can be made to yield a strict maximum of remuneration ; *i. e.*, that the protection of person and property, through education, can be made the most thorough and economical possible. This protection will be most thorough against foreign foes, whether invading, or invaded : witness Germany. But a better protection is against the probability of war itself ; and that is best afforded by education, which exhibits its horrors, and tends to put reason in place of force. People would not stand war if they understood it, — The best protection against sectional strife, — for this is founded on mutual ignorance. So the best protection against individual crime. This is proved by statistics, and founded on principle. Crime is prevented instead of punished. Society deals with the child in the tender age, to give it good principles, instead of with the hardened criminal, to punish bad actions.

Education goes to the fountain-head ; begins at the beginning, at the proper age, cuts up the little weeds, cultivates in the spring-time, establishes the school instead of the prison, the teacher instead of the jailer or hangman ; substitutes reason for force. Edu-

cation protects also from pauperism, by fitting men for the competitions of life. It makes men self-supporting. Finally, it protects us from our protectors. The object of government is to protect citizen from citizen; of a constitution, to protect citizen from ruler. The best constitution is an enlightened people.

An educated people supplies better voters to choose their rulers, better critics to judge their conduct, a better and larger selection of rulers. They best know their rights, they best know how to maintain them. They are strongest to enforce the means. They are the best check on war, on unjust privileges, on discriminating taxation, on all forms of public plunder and peculation.

Thus might we go on with the comparison, item by item, for knowledge underlies all, — individual interests and social interests. It is the universal solvent.

Education is specifically the biggest possibility of all: on it hang the hopes of humanity. We argue not Providential designs and purposes; only this, that they travel this road to reach their goal. We entertain no Utopian views, expect no sudden revolutions, yet they come more rapidly than might be supposed, under less potent agencies.

There is room in the educational problem for the work of many statesmen and many thinkers for generations to come, and opportunity for the highest exercise of practical sagacity, as well as philosophical breadth and acumen. It is, indeed, a problem of the ages, with ever-varying conditions and the necessity for new solutions for each age, with the growing exactions of modern society and civilization. Perhaps as yet we as little understand what and how to teach as how to govern. Our knowledge of both will gradually improve. The great interests of mankind are harmonious, not conflicting. No two honest interests clash.

If this be true, it is a truth of marvellous comprehensiveness and power. To extend the genuine belief and practical knowledge of this truth is the greatest possible boon to humanity. The old maxim, one man's gain is another man's loss, is utterly false, wicked, devilish, the most pernicious doctrine born of hell. Yet the mass of mankind even now believe, and, what is worse, practise it everywhere. The very title of Bastiat's book, "Social Harmonies," is a treatise and a sermon. But we strain at gnats and swallow camels in the action of government.

Why can we educate for war but not for peace; educate soldiers — on the war power — but not citizens and voters. Have we no peace powers? Found asylums for the deaf and dumb and blind, but none for those blind to the sunlight of books, deaf and dumb to the chief language.

Consider the way in which governments really and habitually act. The enormous waste of force by war between nations, war between individuals,—this worse than waste, destruction instead of production, —is shocking, almost inconceivable. Consider the peace armament of Europe, its cost in money, its slavery of men; and all for what? All in the interest of malignity.

This very generation has wasted in war enough to educate and Christianize mankind. And what have we to show for it? Great God! what but infinite loss and ruin, tears and blood? The people perish for lack of knowledge.

Will men never cease to be savages? Never learn that love surpasses hate as the day the night? If there be constitutional impediments to the highest and best means of subserving the ends of government, by all means let them be removed, and, in doing this, get rid of many abuses and old rats' nests. The changes of one hundred years call for improved methods. God spreads before us his boundless universe as if he should say, "There is enough for all, enough for each: why will ye rob and defraud one another? Enter into the great common patrimony of my children." We say it reverently, Rob God! Rob the great common Father! He is not impoverished. Make common cause with God and man, and suck the bountiful breasts of nature. But when you have exhausted what you now know of nature, you have but just begun, for knowledge is infinite; and there is a higher enjoyment than that of nature, even that of society. *Society is God's greatest gift to man.* Intercourse with our fellow-men constantly evokes and develops new faculties and higher powers of nobler enjoyment.

Man must make the most of society and society of man, for either to attain perfection. Largeness of heart is needed as the sand on the sea-shore; and we can never embrace it all, for we are limited and our inheritance is not.

The entrance into this our patrimony is through the gate of knowledge, which lies hard by the gate of justice. To open wide these gates is the function of those allied agents of society, the state and the school. When the school has done its perfect work, there is little left for the state to do.

ORAL INSTRUCTION.

BY LARKIN DUNTON, LL. D.

INTRODUCTION.

IN the days of my childhood it was customary, at least in the neighborhood where I lived, on the frontier of Maine, to begin the study of English grammar by committing the text-book to memory. I remember well the two winters that I labored over Murray's smaller grammar book. Paragraph after paragraph and page after page were read over and said over till the whole book was fixed in my memory; so that, with very little prompting, I could repeat it from beginning to end. And I made no distinction in parts with reference to importance. Definitions, paradigms, lists of irregular plurals and of adjectives of irregular comparison, rules, and examples illustrative of rules and of definitions, all were committed to the storehouse of the memory as wares of equal value.

The accomplishing of this task was no doubt educationally profitable. It was a severe schooling of patience and of perseverance. It fixed the habit of attention and cultivated the power of remembering words as seen on a printed page; but "as the art of speaking and writing the English language correctly," or, indeed, as a means of understanding the science of language, it was a sad failure. No additional examples of the things defined and no new applications of the rules had been required, either in the form of written or of oral exercises. Indeed, no attempt was made by the teacher to secure an understanding of the text; so that when the book was all learned I had had no practice in composition, and was unable to recognize even the parts of speech.

This is, no doubt, an extreme example of text-book learning, pure and simple; but it is by no means a solitary one. I could quote dozens like it from my own experience; and it is undeniably true that there formerly was, and now is, in the country, a great deal of this kind of school work. It was accompanied by no teaching. The work of the teacher was to hear the lessons recited; and this was done with the book in hand, that there might be no undetected errors or omissions.

As, however, the principles of education began to be investigated, and the true methods of teaching to be made known, the harmful results of the practice to which I have alluded, considered pedagogically, began to be understood, and quite a general effort was

made to substitute something better. The result was the introduction of object teaching, lecturing, and oral instruction generally. The text-book was thought to be the cause of the evil, and so it was proposed to cure the evil by removing the cause. Accordingly, text-books were largely banished from many schools. Astronomy was taught by lectures. Geography was learned from maps without names. The spelling-book was discarded. We had talks on history; and oral language lessons took the place of grammar. Some good beginnings were made in observation; but the teacher, in many cases, was too large a factor in this kind of work. Generally there was a maximum of talk with a minimum of study.

But it was soon found that information communicated in this way did not stick. Then came the mania for note-books and abstracts. I have seen the principal of a large school dictating grammatical rules and definitions to his teachers, to be by them in turn dictated to their pupils, written up in note-books, and committed to memory. And all this to avoid using a text-book! In some schools every teacher made her own spelling-book and wrote her own history and geography. And this is not yet an extinct species of folly. But what arrogance to assume that a better text-book can be produced by a tired teacher, pressed with her varied duties in school, than can be written by an experienced author at his leisure! But suppose it were as good, of what advantage is it to make pupils strain their eyes over indistinct manuscript, when clear print is so cheap?

It seems to me that we are in danger of such a reaction from some of the practices of to-day as will carry us too far in the direction of former errors; and it is on this account that I wish to put in a plea for oral instruction. The exclusive use of text-books is one extreme, all oral instruction is the other. The golden mean includes both.

Necessity for Oral Instruction.

Looking at the general question, now, from the subjective standpoint, let us inquire into the necessity for oral instruction.

All elementary ideas arise in the mind in consequence of the presence of the physical world around us or of the ideal world within us. No sounds or marks, that we call words, have the power, originally, of awakening ideas in the mind. The conditions under which it is possible for a word, whether written or spoken, to serve as the sign of an idea, are, first, the awakening of the idea in the mind by its appropriate object; second, the knowledge of the word; and third, the association of the two in the mind, the one as the sign of the other.

When these conditions have been fulfilled, then, and then only, has a word the power of bringing an idea into consciousness.

This granted, and it follows that it is impossible for books to speak to children till the words of the books have been learned; that is, till the ideas and words have been so associated that the sight of the one will recall the other.

Furthermore, written words are primarily symbols of spoken words. A child first hears a word, then sees its written form and learns the form as the sign of the sound and of the idea signified by the sound. No one would think of teaching a child to read written words that were not already known as spoken words. Whether it would be possible to teach a child to associate written words with ideas, independently of the use of spoken words, after the child had once acquired the power of speech, it is not necessary here to inquire, for, practically, it is never done; and certainly it would be a difficult task.

If, then, books are powerless to awaken ideas in the mind in advance of original observation and of a knowledge of words, children need oral instruction in observation, so as to secure as wide and varied a knowledge as possible of the elementary qualities of things and of the names by which they are designated.

Children need, also, oral instruction to secure that constant, lively, and varied action of the imagination which is necessary to its best development. The growth of the imagination is too often left to chance. It is frequently dwarfed from inaction, and often, on the other hand, stimulated to the wildest and worst activity. Again, from false treatment it is made to create false images, by uniting incongruous elements. This frequently happens, because the teacher is ignorant of the laws that govern its action.

It is a fundamental law of the imagination that it builds all its images with the proximate or ultimate elements of knowledge gathered in previous experience. If, then, the action of the mind in this direction is to be healthy, it must be required to construct those images only, the material for which is already in its possession. There are few ways in which young minds are more frequently injured than in making drafts upon the imagination which it is unable to answer. Vague and indefinite conceptions often arise from this cause, as well as confusion of ideas that ought to be distinct. And books cannot set the child right; for books are deaf, and blind, and heartless.

The living teacher, then, is needed to counsel, to direct, to stimulate, and to restrain, as well as to provide materials, to chose times, and to make occasions for the proper and systematic action of this power.

Oral instruction is necessary, too, in thinking. Thought is emphatically the knowledge of relations. No doubt all knowledge involves the perception of relations; and yet the distinction between the knowledge of objects, and the knowledge of the relations they hold to one another, is a valid one. It is one thing, for example, to know the working of the imagination, and quite another thing to know its relation to the powers of observation.

Now the condition of knowing the relation that exists between two objects is a knowledge of the objects in their relation. In other words, relations are known only through a knowledge of things related. The necessity of oral instruction by a living teacher, who watches the child's effort to think, now guiding, now encouraging, now restraining, must be obvious. How many mature minds are led astray at this point! How many often assume to know definitely the relation between unknown objects! I have known even respectable schoolmasters to have definite opinions as to the relative merits of two systems of education, neither of which was fully known to them. And it is not an uncommon thing to meet with members of our profession who are very sure of their knowledge of the relative value of two methods of instruction, only one of which is known to them. If men need checking and criticising and guiding, how much more children!

Again, children often need help in their efforts to think, in bringing related ideas or things distinctly before their minds, and in holding them thus till the relation in which they stand is clear. Take a case. Suppose you wish a child to discover the truth that the product of two factors is the same, whichever is made the multiplier. Place before him five horizontal rows of dots, with six in each row, so arranged as to make six vertical rows with five in a row. Set him to count them, and thus make sure that there are thirty. Let him count the fives, and then the sixes, so as to know for himself that five sixes are thirty and that six fives are thirty. Then, while he is conscious that the six fives are the same as the five sixes, both being present to his sense of sight, ask him which are more, and you have helped him to the thought by simply keeping before his mind the related objects in their relations. I suppose the fundamental difficulty in the solution of arithmetical problems with most children is the inability to represent to their minds clearly the conditions of the questions. How often it happens in such cases that a few simple questions, which bring distinctly before the mind the things of whose relations the problems treat, remove all difficulty!

And so it happens, in thousands of cases, that the voice of the

living teacher, who comprehends the conditions of all thought, is the necessary guide to the formation of the best habits of thought. Early thinking, then, needs oral direction.

Ground to be Covered.

Taking it for granted now that the necessity for oral instruction has been established from considerations of a psychological nature, let us turn to the objective side of the question and inquire what subjects should be specially treated in this way in common schools.

Among the first subjects to be systematically developed by a course of oral lessons is that of mathematics, in the two directions of form and number.

The lessons on form should cover this ground, at least: recognizing and naming geometric solids, including the sphere, cylinder, cube, prism, and pyramid; a study of the surfaces of solids, so as to divide them into plane and curved surfaces, and to decide what kind of surfaces bound each of the solids studied; the shapes of plane faces, including the circle, square, oblong, and triangle, as seen in the cylinder, cone, cube, prism, and pyramid, respectively; the edges of solids for the observation of lines, both straight and curved, as well as for the direction of lines, vertical, horizontal, and oblique; the relation of lines, parallel, perpendicular, and oblique; angles, right, obtuse, and acute; a description of the several solids that are studied; a study and classification of the curvilinear figures, the circle, the ellipse, and the oval; a study and classification of polygons, including triangles, quadrilaterals, pentagons, hexagons, and octagons; a study of solids, for the purpose of classification, so far as to divide them into solids with curved surfaces, — spheres, spheroids, and ovoids; solids with plane and curved surfaces, — cones and cylinders; and solids with plane surfaces, — pyramids and prisms.

These form-lessons should be thorough enough, and should be continued long enough, to fill the minds of the children with the conceptions of the common geometric forms, both superficial and solid, to fix their names, and to make them familiar with the principles of classification and of logical definition. For the training of the mind to habits of exact classification and definition, perhaps there is no subject better than form, inasmuch as the generic and specific qualities can so readily be presented to the eye.

Oral instruction in number should appeal to the perceptive powers, the imagination, and the thought faculty, successively, step by step. Perceived objects should be numbered, added, subtracted,

multiplied, and divided; imagined objects should be treated in the same way; and then should follow the operations upon the abstract ideas of numbers. Signs of numbers, both oral and written, should be used in connection with these three kinds of treatment. The danger from too protracted a use of objects is about as great as that from beginning the study of numbers with the learning of names and figures. The first two stages of the work, as here indicated, are to prepare the mind for the third; and, when the mind is thus prepared, the student should be allowed to advance, and not be kept marking time.

Nowhere is oral instruction more needed that in the natural sciences. A child, if left to himself, will pick up some of the elementary knowledge out of which these sciences are to be constructed; but his ideas will be limited in their range, and on many points vague, unless his observation is directed by one who is familiar with the whole ground.

As a preparation for reading treatises on botany, zoölogy, and mineralogy, there is needed a systematic, protracted, and well-directed observation of plants, animals, and minerals. Lessons on these subjects, when given at all, usually fail for lack of system. Weak, random talks, whether by teacher or pupil, about what is well known, are not a sufficient preparation for the study of books. All the elementary ideas involved in the treatment of the subjects by the books are to be acquired by the pupil's own original research.

Lessons on the human body should be included in a course of oral instruction. These lessons should cover the following ground, if not more: parts of the body, parts of the head, parts of the face, the neck, parts of the trunk, the arms, the hands, the legs, the feet, the eye and sight, the ear and hearing, the nose and smell, the tongue and taste, the sense of touch, the teeth, the skeleton, the muscles, the skin, the circulation, respiration, and digestion.

The immediate object of these lessons should be to give the pupils a knowledge of the human body, — of its parts, their relations and functions. The ultimate object should be to give them a reverence for their own bodies, and to create both the ability and the inclination to lead lives of temperance and self-restraint.

While these lessons, then, are to be based upon, indeed to consist mainly of, observation, the knowledge thus acquired is to be constantly supplemented by the teacher. Apparatus for this class of lessons is inexpensive; for each child is supplied with at least two subjects, himself and his neighbor.

Color lessons should not be omitted from this list; for, of all elementary ideas, perhaps no others constitute so large a part of the imagery habitually present to consciousness in our ordinary processes of thought as form and color. Not only form, then, but color, as well, would I make a special object of well-directed study.

Lessons on this subject should include instruction on the prismatic colors; tertiary and neutral colors; standard colors, hues, tints, and shades; production of colors; and harmony of colors. Each of these divisions of the subject should receive such special care that the eye would be well trained to perceive colors, the memory to represent them, and the taste to feel the influence of their harmonious arrangement. There is one phase of this subject that deserves more attention than it usually receives: I mean the naming of colors. I know of no department of human knowledge where names are applied more indefinitely than in that of color, — psychology and metaphysics alone excepted. It is well also to bear in mind that in this department, as in all others, time is a necessary condition of good training.

Vocal music, also, deserves to be mentioned in this connection. This is generally conceded. And yet there are those who regard vocal music as of too little practical value to be worthy of a place among studies proper for the common people. But if *practical* means, in its ultimate analysis, capable of producing happiness, then the objectors to music cannot have well considered the question; for the power of song is a perennial spring of joy.

Vocal music can be learned only from oral instruction. It consists of a series of sounds, varying in pitch, time, and timbre, and related to one another in harmony and rhythm. Not one of these qualities or relations can be learned otherwise than by the ear. It is true that we may learn the written signs of the sounds from a book; but then the signs will be merely the signs of the names. We may also learn the names of the sounds from a book; though, strangely enough, when we seem to have done so, the names we have learned are only the names of the signs; so that when we hear these names they awaken in our minds only the ideas of the signs of the sounds, and not the ideas of the sounds themselves. Sounds, which, alone, constitute music, can only be learned by hearing them. Oral instruction in music, then, should always begin with the teaching of sounds; and the relations of sounds in harmony, rhythm, pitch, and time should be taught by teaching the sounds in these relations. When musical ideas are clear and distinct in the mind, then names and signs may be taught that will really be names and signs of the elements of

music. When this stage is reached, the pupil is prepared to read music without the aid of teacher or instrument. I regard the proper teaching of music itself as of far more importance than any question relating to systems of musical notation.

A plan of oral instruction should include lessons in morals. I know the discipline of the school-room is itself a great moral lesson; but still there are many duties that it does not teach, and many which, if left to chance, will never be taught at all. Let the duties of pupils to themselves, to the school, to society, and to God be carefully mapped out and the ground fully covered. Let example be followed by precept. Let instruction as to duties, and as to the results of their performance or neglect, be given. I care not whether these lessons come at stated times or not; I only insist that they be given. If this is done, the result will be more thoughtfulness and self-restraint on the part of pupils, and a race of better men and women; for conscience will be quickened by a knowledge of duty, and correct practice will ripen into habit.

Oral instruction in language includes, of course, the three departments of speaking, reading, and writing.

How shall we teach children to talk properly? Language lessons, so called, are frequently productive of no good results. Language is not an end in itself, it is rather a means to an end; and that end is the expression of thought. Will not this truth give us a clew to the method that ought to be pursued in teaching language? If power to do is acquired by doing, then power to talk must be gained by talking, — power to express thought by expressing thought. Of course, back of the thought lies the acquisition of thought, and the acquisition of language with which to clothe the thought. And what mean those years of silent hearing passed by every infant? What is then the occupation of his mind? He is observing things, acquiring ideas, and hearing names; thinking thoughts and hearing sentences. The same thought is in his mind, accompanied by the same oral expression, perhaps a thousand times, before he attempts its utterance himself. At last he begins to feel the power of that universal human impulse, which moves us to communicate to others the thoughts and feelings in our own minds. And then he is forced to speak. This, then, would seem to be nature's method of teaching children to talk: first, numerous impressions of truth and language; then, after patient waiting, and under the influence of an inward monitor, expression. If, then, the natural method of acquiring speech is to be continued with children after they enter school, this is the law underlying all elementary language lessons: make the thoughts so clear, the interest so

great, and the words so well known, that the child will be forced from within to make an effort to express what is in his own mind. All lessons, then, based upon the assumption that the child is to make an effort to use language correctly, are out of place. The child's effort is to be to communicate his thoughts. Of course wrong expressions are to be corrected, and he is to be led to express the exact truth. But all mere sentence building, constructing sentences that shall include all the parts of speech, finding adjectives to fit given nouns, and nouns to suit given adjectives, making sentences after special patterns, constructing simple, complex, and compound sentences, — all such exercises, however useful they may be in studying the science of language, are not in place in a course of oral instruction, the object of which is to give the children the power to tell what they think.

The first lessons in reading are all oral; or, if the book is used at all, it plays a subordinate part. The successive steps in first lessons in reading may be as follows: the awakening in the mind of a distinct thought, either by the use of objects or by means of oral speech; the expression of the thought by the use of an oral sentence; the exhibition to the eye of the same sentence, either in print or script; the reading of the same, both by the teacher and the class; the reading of the separate words, by both teacher and pupils, till they can be easily called, both in the sentence and apart from it; the separating of the words into syllables, and the study of the syllables till they can readily be called; the learning of both the names and powers of the letters; learning to make the separate letters; the uniting of the letters to form syllables and the calling of the syllables; the joining of the syllables to form words and the calling of the words; the uniting of the words to form sentences and the reading of the sentences thus formed. Were we anxious for a new term, we might call this the analytico-synthetic method. It begins with the written sentence as the expression of a thought already expressed orally; analyzes the written sentence into its proximate, and, finally, into its ultimate, elements; shows the equivalent in oral speech of each element; teaches the pupils to form the elements, and then proceeds synthetically to reconstruct the sentence.

As sentences represent thoughts, the unit in the expression of thought is the sentence; as words represent ideas, the unit in the expression of ideas is the word; but as spoken words are composed of separate sounds, and as each sound is represented in the written word by a separate letter, or a group of letters, the unit in the written expression of sounds is the letter. If, then, the pupil, dur-

ing his oral instruction in reading, is to be made to do habitually what he will be obliged to do without direction, when he comes to read new words and new sentences by himself, he should be required at the outset to recognize sentences and words not only as standing for thoughts and ideas, but also as the representatives of spoken sentences and spoken words; and he should also be made to know the letters as symbols of elementary sounds. Not till this last point is thoroughly made is he prepared to call new words without help.

The nature of the instruction required in penmanship may be inferred from the fact that to write a word with ease requires a definite conception of the form of the separate letters, and the habit of moving the pen in such a way as to make these forms. Securing the first point requires the production of the forms by the teacher, and the calling of the attention of the pupils to all the elements of the forms, while the habit of moving a pen in a given way is secured only by moving it in that way. Instruction, then, in regard to forms of letters, and also in sitting, pen-holding, and movement, is to constitute the work of the teacher. This is to be accomplished by combining class instruction and drill with individual instruction.

Oral instruction in composition should include the formation and criticism of analyses so as to make them clear and logical; the collection and arrangement of material; the division of the work into paragraphs, and of the paragraphs into sentences; proper punctuation, the arrangement of the composition on the page, and criticism of style. Reading and practice will do the rest.

I have now indicated briefly the work to be done, through oral instruction, in mathematics, the natural sciences, physiology, color, music, morals, and language. To these subjects I would add lessons on the general qualities of objects, whenever the teachers were competent to give such lessons. The object of this kind of work would be to form the habit of thoroughly observing everything that comes within the pupils' reach. It may be well to add that the list of topics here given is not intended to be exhaustive, but only to indicate those that seem to me essential to anything like a well-rounded preparation for a comparatively independent study of books. Indeed, I am inclined to go so far as to say that, in my judgment, a student is always helped in his reading upon any subject by a course of introductory lessons given by a thoroughly competent instructor. This is true of pupils in the higher schools as well as of those in the lower. These introductory lessons, or lectures, should accomplish two things: fix in the minds of the students, clearly, distinctly, and

vividly, the leading conceptions of the subjects to be treated, and also take the students over ground enough, and secure such work by them as will make clear to them the right method of study and establish the habit of following this method.

Plan of Lessons.

Let us now consider briefly the plan or programme of lessons that must be arranged as a condition of doing this kind of work effectively.

Education, in the fullest sense of the term, implies the complete and harmonious development of all man's powers. The accomplishment of all this requires the systematic exercise of all his powers. So the education of a child in any one direction implies systematic exercise in the same direction. Object lessons, language lessons, — oral instruction of all kinds has oftenest failed to accomplish the work hoped for by its advocates for a lack of a well-defined plan upon which it should proceed. A few lessons have been given upon this subject, and a few upon that, with no definite intent, forming no part of a matured scheme, beginning nowhere in particular, and ending anywhere in general. Striking the keys of a piano at random is not learning to play. Promiscuous lessons on a variety of subjects, or any one subject, result neither in scientific knowledge nor good mental training.

The first requisite, then, for good oral instruction in any school or system of schools is a definite programme. Who can make it? It is too often left to the individual teachers, and sometimes to the youngest teachers. This is wrong, for most teachers are not competent for this work. The making of a good programme, as has well been said by one of our wisest educators, is the most difficult of all educational work: it requires the greatest ability and the broadest knowledge; it should not therefore be intrusted to young teachers. School boards, as such, should never attempt it. It should be intrusted to a council of the ablest, the wisest, and the most experienced educators of the land. Ample time should be given for the consideration of every point of the programme, both in its direct effect upon the minds of the pupils, and in its relation to other subjects. No one branch of study should be admitted to or rejected from the programme, and the ground to be covered by no one subject should be decided upon, till the opinion of the wisest teachers of the world upon the point is known, and the question definitely asked and answered, whether the special conditions of the

case require any modification. And when a programme is thus made it should never be changed, except after the most deliberate consideration and for urgent reasons.

Now what should such a programme determine in regard to a course of oral instruction? First of all, the subjects upon which the lessons are to be given. These will depend somewhat upon the social condition and home training of the pupils, the length of time they are to remain in school, and the pursuits in life for which they are destined. A boy who is to continue at school but a few years may need to be differently treated from one who is to take a college course and study a profession. All must learn to read, write, and cipher, whatever else is neglected. Secondly, the programme should determine the number of lessons to be given upon each subject. It is not enough to say, teach color and form; for one teacher may have a taste for the one subject, and another for the other; so that in each class the one or the other will be neglected. Thirdly, the topic for each lesson should be given. I see no other way to secure the full treatment of any subject. If left to themselves, teachers of different grades are in danger of handling the same topics; so that part of a subject will be studied several times, and part of it not at all. And, finally, the order in which the lessons are to be given should be determined. It is of the utmost importance that each subject receive an orderly and systematic treatment. This is the only way in which perception, imagination, and reason can be well developed; the only way in which pupils can be trained to good habits of study; and the only way in which the best knowledge of the subject studied can be secured.

It may be objected at this point that the specific directions by the programme here recommended would tend to trammel the teacher, and that more latitude should be allowed for the exercise of individual judgment. If every teacher was a profound philosopher, the point would be well taken; but, unfortunately, we are not all of that class. And, besides, I have supposed the programme made by the highest wisdom attainable. There is another incidental reason why I would have a definite programme of oral instruction. It is much easier for a non-professional to examine in text-book work; and, consequently, where education is directed by those not skilled in the work, oral instruction generally receives little attention. The result in many cases is, that this kind of work is the merest farce. But the most inexperienced member of a school board can ask whether a teacher has completed the programme, and require to have a specimen of the work exhibited.

Aim of Oral Instruction.

But programmes will never make good teaching. Back of all and above all is the living teacher. If he is intelligent, good, and earnest, he does good work. One item of his qualification, in particular, I want to mention here. To be able to give oral instruction effectively he must know the true aim of the work. How often I have seen object lessons given when the teacher seemed to be merely fishing for words, — and fishing in a dry pool!

The true object of oral instruction I conceive to be threefold, — training, knowledge, and expression. It is possible to make either factor too prominent. We may make sharp intellects, that possess little valuable knowledge or power of expression; we may impart knowledge in such a way as to develop in our pupils little power either to think or to express; or we may make fluent talkers and writers, characterized by weakness and ignorance. Neither of these is the highest type of man. Perfection requires power, wisdom, and speech. It is not a sufficient recommendation, then, either of a subject of study or a mode of treatment, that it disciplines the mind. It is not enough that it makes the pupil wise, or that it makes him fluent of speech. The true test for every course of instruction, and for every lesson in the course, — and this is emphatically true of oral instruction, which fashions the mental habits, — is this: does it result in that self-activity of the pupils that gives them additional power to act; does the subject matter stand in such relation to human interests, and especially to the interests of these human beings, that the resulting knowledge will be of the highest practical value to them; and are they the better prepared to put themselves in communication and sympathy with their fellow-men? Oral instruction that will not bear this test should not be allowed to waste the time of pupils.

And here I might leave this part of my subject. But there is one error connected with oral instruction, in common with text-book instruction, so important, and at the same time so common, that I wish to point it out. I refer to memorizing the language of the instructor. It seems to me doubtful whether this practice is ever justifiable. As before said, language is for the expression of thought; and, if an oral lesson has not resulted in making pupils think thoughts that they wish to express, it might as well be considered a failure, and the language side of the lesson be omitted.

Method.

A few words on the methods of oral instruction, and I am done. The teacher's part in the lessons may be briefly described. He is, first, to furnish the material upon which the minds of the class are to be exercised, which may be material for the exercise of the perceptive powers, or of the imagination, or of the reasoning faculty, or of all together, according to the nature of the lesson. Secondly, he is to direct the activities of the children, both in the class and outside the class; for every lesson should require some outside work. Thirdly, he is to name the new objects, qualities, and relations that the children discover. And, finally, he is to teach the correct expressions for the truths discovered. This, let it be observed, does not require much talking. Were I to attempt to give a single formula, the observance of which would secure good oral instruction, it would consist of these words: *be silent.*

The work of the lesson, on the contrary, belongs to the children. This consists of two parts. The first includes exercises in observation, imagination, and thought. These are to be performed under the direction of the teacher. If the lesson, for example, is one in observation, the children are to observe the objects furnished by the teacher, and to observe the parts in the order directed; and then they are to observe objects, as directed, outside the class-room. If each child takes charge of himself, the teacher ceases to be a teacher. The second part of the children's work is the expression of the new knowledge they have gained. This should be done orally in the lower classes, and both orally and in writing as the pupils advance.

Conclusion.

I believe that in many schools in this country we are to-day acting as wildly, as irrationally, as foolishly, in attempting, through oral instruction, to relieve our pupils of the labor of overcoming difficulties for themselves by doing their thinking for them, as ever those old schoolmasters did, who fed their pupils on text-books from the beginning to the end of the year. If I must take my choice between all talk and all text-book, give me the text-book, and I will trust to future experience to make it comprehensible. And yet I believe that a course of oral instruction such as I have attempted to sketch is useful both as a means in itself of the best education, and as a preparation for the profitable study of text-books.

ON THE RELATION OF THE PROCESSES OF ACQUISITION AND MEMORY TO ELEMENTARY TEACHING.

BY GEORGE P. BROWN, A. M., PRESIDENT INDIANA STATE NORMAL SCHOOL.

My theme is akin to some that have been discussed in some of the other departments of this Association, and especially to one elaborated with great ability and power in a paper entitled "The Limits of Oral Instruction." That very suggestive paper has set me to thinking of the signification of the terms *analysis* and *synthesis*, words used to name two methods of obtaining knowledge.

It is said that "There are two methods for the mind to employ in obtaining knowledge, the analytic and the synthetic. The use of the first requires the object of knowledge, with all of its parts and elements and relation of parts, to be before the mind of the learner at the first. When the mind has known the object as a unit, it is to unloose the parts from one another by analysis, and consider them in themselves and in their relations.

. . . . . .

"The movement of the mind in the acquisition of knowledge must always be from whole to part, if we would prepare the mind for the independent and successful activity in the study of any object or branch of knowledge. A synthetic method of independent study is impossible."

"The primary requirement is that the object of knowledge, with all of its parts and elements and relation of parts, shall be *before the mind* of the learner at the first. *To be before the mind* may mean that the mind already has a vague, or not clear, "knowledge of the object, its parts and elements and relation of parts"; or it may possibly mean that the object is in such proximity to the mind or senses that the mind can contemplate it. The latter interpretation would seem to limit the objects of knowledge to objects of sense. If the former is the proper interpretation of the meaning, it would seem that the process of acquiring knowledge of an object must start from knowledge previously acquired. Then the question arises, "By what process was this knowledge obtained?" If the second is the proper interpretation, then the question recurs, "By what process does the mind gain its first knowledge of an object?" The character of this first movement it seems important to clearly see. Sir William Hamilton gives the following as a psychological law: "The first procedure of the mind in the *elaboration* of its knowledge is always analytical. It descends from the whole to the parts, from the vague to the

definite." He adds, "These two processes, synthesis and analysis, are not, in strict propriety, two several methods, but together constitute only a single method." A conscious activity of the one is impossible without there being at the same time a more or less conscious activity of the other. He says further: "It is manifest in general from the meaning of the words that the term 'analysis' can only be applied to the separation of a whole into its parts, and that the term 'synthesis' can only be applied to the collection of the parts into the whole."

It is evident that in the elaboration, *i. e.*, the *perfecting* or *refining* of its knowledge of an object, the mind naturally proceeds from a whole vaguely known to the parts composing it. But this assumes that the mind already knows a complex whole. The process by which the mind originally constructed that whole must have been a synthetic process. There seem then to be two processes by which the mind naturally gains knowledge of an object: one process, which results in the knowledge of elements that are wholly new and the joining of them to the elements already known; and another, which results in a clear knowledge of the relations of these elements. "To know an object is to be certain that it *is*, and to be certain of its relations to other things, and of its parts to each other and to the whole."

Whether any particular process of acquisition should be termed analytic or synthetic would seem to depend upon (1) what the whole process starts from, and (2) what is the immediate end sought by the instructor.

1. Every object which furnishes an occasion for knowledge to the pupil, and for instruction to the teacher, may be viewed as one of three different wholes. (1.) One of these is the object as it really is, — what the Creator sees it to be. (2.) Another is the whole composed of those elements which the teacher sees in it. (3.) What the child sees in the object forms another whole.

Let us suppose, by way of illustration, that a mind without any experience in knowing, and therefore without any power of using the knowledge gained by one sense as the sign of knowledge that another sense would give, should set out to gain knowledge of an apple. By applying the sense of sight, a knowledge of form and color is obtained. These are all the attributes known by sight. Since the form is space-filling, it can be separated into parts. There is an involuntary or spontaneous act of synthesis performed which unites these two elements into one spatial whole; but no analysis of the whole will give *flavor*, or *hardness*, or *smoothness*, or any other attribute of the apple.

There are new and independent elements given by other senses and by the process of synthesis united with the elements already known, forming a more complex whole. It is true that with every act of synthesis there is an accompanying act of analysis. It is impossible to perform one of these acts without at the same time performing the other; but the process of which the learning mind is most conscious seems to be the synthetic. After the child has learned to perceive, and can make use of the acquired perceptions (so called), his act of spontaneous synthesis gives him a much more complex whole, the knowledge of which is made clear by analysis. It seems to be true also, that when the mind is engaged in the study of the elements or parts of a thing, the conditions are most favorable for the discovery of other elements or parts not previously known, which, when discovered, are at once united with the other elements, forming a new whole.

If we occupy the point of view of the instructor who is striving to lead the child to construct or synthesize a whole similar to the whole which he knows, then the process seems to be prominently analytic. Every movement of the teacher's mind with reference to his whole is an act of separation. But, should he chance to discover some new element, he immediately unites that in its proper relation to the other elements, and thus constructs a new whole.

Nor does it seem to be different in learning complex abstract notions. A mind that knows nothing about the state cannot learn anything about it by pursuing rigidly a process of analysis of any whole with which it may start. Suppose that it starts with the word. Its whole is simply an empty form. The process by which that form must be filled is pre-eminently a constructive, a gathering-together process, rather than a process of separation. It is by the study of the relations of the elements found to be in a thing, and of the relations which the thing as known holds to other things, that new elements are brought to view; and in this sense it may properly be said that the analysis supplies conditions favorable to the acquisition of new knowledge.

2. Whether the process of the mind is consciously analytic or synthetic depends, in the second place, upon the nature of the immediate purpose sought to be realized by the instructor. If the end is the acquisition of new knowledge, the process is synthetic; each new element being joined to the old whole by a synthetic judgment, — synthetic from the learner's point of view, but analytic from the standpoint of the teacher. If the immediate purpose is to make the learner's knowledge clear, — to make that which is vague and indefinite clear and definite, by which is meant a seeing of each element

or part of the complex whole in its proper relations to the other elements or parts, — then the process is consciously analytic.

The inductive method is analytic rather than synthetic. By it we proceed from the particular to the general, — from the complex to the simple. The deductive method is prominently synthetic, the mind proceeding from the general to the individual, from the simple to the complex, the general notion ever being less complex than the particular under it.

I now pass on to the consideration of the relation of memory to elementary education.

I shall not consider memory in that special sense which limits it to the power to *re-know*, — to recognize old acquaintances, past experiences, — nor in that other sense, which limits it to the power to reproduce those general notions, which are the products of generalization, and are put under the arbitrary forms of language, but shall give to it the more popular signification of that endowment of the mind which retains and recalls past experiences.

By elementary education, I mean the exercise of that class of mental processes which result in products which we call facts. It differs from scientific education in that there is but little or no conscious study of the logical and necessary relations of these facts by which they are bound together into that unity which we call a science.

By a fact, I mean a synthesis of elements which the mind gathers together and views as a whole, and not as a stage in a process. The universe of mind and matter is an organism. The law of its being is activity. Every thing or fact that is at any moment of time is some stage of one of the infinite variety of processes or movements toward some definite end. It was conditioned by all that preceded it in the process, and it will be the condition of all that follows it. But when cut off from what has preceded and what will follow, and viewed as a whole and not as a part of some great whole, it is a fact. Facts seen in their logical relations constitute science.

Elementary knowledge rigidly defined is a knowledge of these facts as facts. Scientific knowledge is a knowledge of these facts as necessarily related to their antecedents and consequents in the process. Elementary education is, therefore, a leading of the mind to perform those processes which result in elementary knowledge.

But it is needful that we guard against the misconception that there is any period of a person's life when the process of education will be exclusively elementary; when he will deal with facts independent of their relations; when he will be unable to make any gen-

eralizations or inductions. Certain it is that there is no such period after he enters school.

He must generalize before he can make any intelligent use of language. Every word names a general notion, and not a particular. This power of generalization and of induction, by which what is common in the particulars observed is extended to those not observed, is possessed by every child of school age. There is therefore no period of a child's school life in which he is wholly incapable of scientific education. The logical power is weak in early childhood, while the powers of observation, memory, and imagination are relatively strong. The wise teacher makes use of what nature has furnished, and is content to wait for what will not be given until another period.

Having explained what is meant by elementary knowledge and education, I now pass on to a fuller elaboration of the definition of memory.

Memory, as defined above, admits of a separation into different species: —

(1.) There is the *spontaneous* and the *intentional* memory, differing in this, that there is a conscious activity of the will in the one that is not in the other.

(2.) The conscious and the unconscious memory. By unconscious memory is meant that power of the mind to retain its acquisitions and assimilate them so that they become, in a sense, a part of its substance, forming an important element of that complex whole which is called character. It helps to form the soil from which ideas spring when occasion calls for them, the reservoir from which are drawn the materials for reflection and into which many of the products of reflection and observation flow. It is the great conservative power of the mind; nothing that goes into it is lost. It may never afterwards appear in consciousness in the form in which it sunk into unconsciousness, but it is an abiding ingredient of the soul, modifying its capacities and powers.

(3.) There is also a memory of the objects of sense and a memory of objects of reflection. Under sense, memory is the memory of the eye, of the ear, and the like. The memory of the eye may be a memory of form or of color. Reflective memory has under it, memory of processes, of results, of laws, of causes, of similars, or generals, etc. So independent of each other do these powers seem that Beneke declares that memory is not one faculty, but many, and that the cultivation of one memory has no effect upon another.

Of the relative importance of conscious and unconscious memory in education, much might be said. It is a prevalent error among

teachers to undervalue the latter. Many school practices and requirements emphasize the importance of conscious memory. This is well. There are few or none that suggest to either teacher or pupil that what he once knew but has now forgotten is not lost. This is not well. The influence of examinations and class records, and the determining of rank by per cents, are to teach that what cannot be called back into consciousness of what has been learned is of no value. This works the evil, especially in the higher schools, of contracting the field of view of the student, and of causing him to expend his mental energy in recollecting when it might better be expended in assimilating. What is merely recollected still continues to be objective, and, in a sense, foreign to the mind. What is assimilated passes on into character. For this reason it is not strange that the man who leads his class by the examination test often follows far behind when he comes to be judged by the tests that society applies.

I would not be thought to undervalue examination tests, but, rather, to urge the application of such other tests as shall lead the pupil to a just appreciation of the unconscious possessions of the mind.

We are wont to say that the condition of memory is that the object shall first be known; and that to know, the mind must attend; and that attention is conditioned by a feeling of interest. But original knowing, beyond the slight and superficial knowledge which sense, perception, and consciousness enable the infant to experience, — which knows the thing only so long as it is before the senses, — is dependent upon the memory. Without memory, mind could perform none of its other functions. It is, therefore, fundamental to all knowledge.

"Memory is the great keeper or master of the rolls of the soul, — a power that can make amends for the speed of time in causing him to leave behind those things which else he would so carry away as if they had not been."

The "old education" was probably wrong in some of its practice, but it was orthodox in doctrine when it taught that the mind should be early furnished with a store of true and noble forms which the future is to fill with their proper content.

In considering the relation of memory to elementary education, I remark: —

That, during this fact-acquiring period, the faculty of memory is especially active, particularly that phase of it which recalls individual objects, — the recollection.

Nature has provided that, during this period of comparative inac-

tivity of the understanding, the mental energy shall be employed in the storing up of material for future elaboration. It is the period of the acquisition of forms of knowledge having a small and vague content. These forms of knowledge may be either forms of things in nature, or words, — which are artificial forms of knowledge. The natural forms of knowledge are obtained by the perception of material objects. The child perceives a pebble. He acquires a form like that which the scientist or philosopher has; but how empty is it compared with theirs. He sees only the skin of the thing; a natural skin, it is true, but it has hardly a greater content of knowledge than has a word the meaning of which he does not possess. And this skin is all the child at first cares to know. He attends to it for a moment, long enough to seize it, and then rushes on to some new acquisition. He may inquire what it is, but his question is answered when he learns its name. He has neither inclination nor ability to make an exhaustive study of the pebble. Any effort to force him to do this will result either in failure or in mental deformity.

In learning oral language the child learns to associate the visible form of the object with an audible form or sound. In learning printed language the association is made between two visible forms. This association being made, it will then follow that when either of these is presented to the mind the other will be recalled.

The question is suggested, What is the order in which the child learns words or audible forms? Is it first the thing or natural form, and then the word or artificial form; or, is it first the word and then the thing?

The movement of the mind in *inventing* a language is from the thing to the name. Is this the only proper order of procedure in *learning* a language? Observation of the process by which a child learns to talk will show that the movement of the mind is quite as often from word to thing as from thing to word. Reflection would lead to the same conclusion. The word is a thing or audible form; while the object, pebble, is a visible form. What the mind must do is to associate these two things as name and thing named. There is no psychological law that requires that the mind shall invariably proceed from one to the other rather than from the other to the one. It would require half of a lifetime to learn to talk as well as a child eight years of age, if consciousness of the necessity of a word were made to precede always the learning of the word.

In the acquisition of knowledge from the printed page, or by oral instruction, the movement of the mind is from word to content. "But shall the child learn words the meaning of which he does not

understand? This is mere verbal memory, the besetting sin of the old education." Shall the child learn to repeat any Bible texts, or gems of poetry or prose? In doing so he will learn to use many words that convey to him absolutely nothing of their true significance, let the teaching be ever so skilful.

I formerly knew of a boy who is now an intelligent and valued member of society, who early learned to repeat the text, "The wicked flee when no man pursueth, but the righteous are as bold as a lion." For years he interpreted "the wicked flee" to mean a wicked flea. It would seem that he could have had no conception of the meaning of the text; and yet I believe that in the final outcome it was quite as well for him as it would have been had he spent the time required to memorize the text in a microscopical examination of the insect which his fancy pictured.

I am no advocate of mere verbal memorizing at any stage of one's education; but there is a Scylla quite as fatal to true progress as this Charybdis.

The impulse to make a language is an instinct of the soul. The child is naturally impelled to learn the language which is constantly used in his hearing. There is no apparent reason why he will not seek with as much interest to discover the content of a new word as to learn the name of a new thing. It is not material in what order these are presented. The essential thing is that the child put the best content he is able to form into the word at the earliest moment practicable. The teacher should avoid a literal and narrow interpretation of the dogmas, "Things before words," "The consciousness of the need of a name before giving the name," lest he impede the spontaneous activity of the child, which drives it on to accumulate a store of outlines or moulds of things which future elaboration by the higher powers will fill.

A teacher may be of great service to the pupil at this early stage in his education, provided he does not fall into the error of thinking that everything which the child has known during the term must be at his command, ready for reproduction on examination day; or, that everything which the child learns must be known to the pupil as it is known to the teacher; or, that there is some fixed and necessary order of procedure which requires conceptions to precede words, or words conceptions; or, that the higher powers of comparing, generalizing, classifying, judging, and reasoning are not active in very young children; or, that the study of a book for the purpose of interpreting its language may not be quite as valuable an exercise for the child as a study of the physical properties of the material object.

Prominent among the instrumentalities used by the teacher to lead the pupil to acquire and retain facts and experiences is the text-book. One needs to keep constant guard over himself to avoid a too implicit reliance upon much that is put forth under the supposed sanction of philosophy upon the use of text-books. The logical result of some of these teachings would be the abolishment of the book from the school.

One of the prominent leaders of educational thought in America says: "Books in abundance may be used, and lectures may be given, but they are to be used to call the mind of the student to a fresh and more thorough study of what has before been taught; they are not to be used as the" (student's) "original sources of knowledge." It is in books that we find recorded the thoughts and experiences — the achievements — of the race. Without a knowledge of what has been found out, each one must begin where the race began, and by the slow process of discovery achieve what he may. Each generation would merely repeat the experiences of its predecessor. That in which the world to-day differs from what it was a century or sixty centuries ago is to be found recorded in books. What it is to-day is what its different institutions are. But these are only the embodiment of the thoughts of the past. When we study them we are merely discovering what those have thought who have gone before. The actual institutions of society are, in a sense, books containing the record of former generations.

The great value of a book seems to be that it enables one to realize within himself the essential thoughts and experiences — the spiritual achievements — of the race in much less time than was required for their original production.

A rational study of a text-book causes activities of soul in the student similar to those experienced by the original discoverer. In so far as he experiences their thoughts and feelings, he is doing what the original discoverers did; and, what is more to the purpose, he is being trained in a right method of thinking.

In the text-book is preserved the essential truths which mind has discovered, and the relations of these truths; and these the learner may seize and appropriate without the waste of energy attendant upon the exploration of ways that lead to error, into which the original discoverer was led because of his ignorance. It is through books that the present generation is able to rethink for itself what has been thought in all former times, as a preparation for the forward step in the progress of the race which it is to take. It would seem, then, that the type of school instruction is that which has for its purpose

the preparation of the pupil to take possession of this inheritance by teaching him how to master books. But this does not imply meaningless rote-memorizing. The mastery of books means the mastery of the meanings of words and of thought processes. This can best be done through objective illustration and a practice in the application of these processes to the solution of new problems. A text-book is mastered when the student is master of its ideas and processes; nor does it seem to me that the influence of such teaching is merely to "prepare the mind to understand, it may be, what others have done, but gives it no power to do anything by an independent exertion of its own powers."

Progress toward reform in school teaching will be made, not by abolishing the use of the text-book, nor, as it seems to me, by refusing to make it an "original source of knowledge to the pupil," but by a more rational teaching of it. There is quite as large a field for training "the active powers" of the intellect in seizing and assimilating the thoughts and processes from a printed page as from an object of sense. The condition of progress in both cases is that these thoughts and processes shall be seized and assimilated. What is wanted is not *less* use of text-books, but *better* use of them by better teachers.

Facts of acquisition and memory may be classed as material and spiritual. A material fact is the material object or thing as known. A thing is an embodiment of the fact. A spiritual fact is embodied in the artificial form of words. Either form of expression, as has been already said, conveys to the unlearned but a meagre notion of its full significance. Each person puts into it what is in himself and no more; but, if stored up in the memory, it serves as a nucleus about which other ideas may gather, and into which a larger content may come.

Mr. Payne has said: "Memory will hold in charge many things which are imperfectly understood, formulas whose meaning is obscure, abstract truths which await their explication, definitions to be made clear, sentences which do not transmit the thought of the writer, empty words which are to be filled with meaning, isolated facts which require classification."

Another has said, "A downright scholar is one that has much learning in the ore, unwrought and untried, which time and experience fashion and refine."

THE TRUE PLACE OF A NORMAL SCHOOL IN THE EDUCATIONAL SYSTEM.

BY HON. D. L. KIEHLE, STATE SUPERINTENDENT PUBLIC INSTRUCTION, MINNEAPOLIS, MINN.

THE true place of an institution, as of an individual, is found, *theoretically*, by discussion; but practically it is found by asserting itself in its ability to take and to hold the position it claims, "possession being nine points of the law."

Discussion is, then, both profitable and natural at the time of or preceding the practical demonstration of the power of the institution to settle questions not at the outset anticipated.

It would not, however, be to the credit of the responsible advocates of normal schools, nor to the advantage of the schools themselves, that this question of their true place should too long be a matter of controversy; for, if the representatives of education do not yet agree upon the place the normal school should fill, it will not be a surprise if the people, who know more of their cost than their profit, should be in doubt whether, indeed, there is any legitimate place for them, and whether they are not an intrusion and an unnecessary expense.

I must begin this discussion by expressing the judgment that we are quite near the time when this theme should be superseded by others pertaining to the development of the system; and yet, in view of the unsettled policy and very diverse character of these schools, and the unstable relation they sustain to the system, I am as well satisfied that there is a demand for serious inquiry into the causes of present distrust, and why normal schools have not proven their right to position by taking it and holding it in undisputed possession.

In determining what the orbit of a new planet is or must be, the astronomer takes into his estimate certain fixed data of gravitating tendencies never to be lost sight of. So, in estimating the probable course of any new institution, there are certain social gravitations or tendencies which may always be reckoned upon to dispose it to certain fixed forms. Of those that apply to educational institutions I mention two.

First is the conservatism of habit. What men have *done*, and have believed, is what they are determined to hold to as what ought always to be done, and must still be believed. Intelligence and learning have by no means annihilated this rank conservatism among educators. Teachers of schools have been as set in their forms of

work as ever priest or Pharisee in the dogmas of his faith or the form of his worship; and only some fearless reformer with the spirit of Elijah can compel progress. To know how far reason and reasonable methods have prevailed over prejudice, hear what is said by the author of the article Education, in the last edition of the "Encyclopædia Britannica": "Schoolmasters are still spending their best energies in teaching subjects which have been universally condemned by educational reformers for the last two hundred years. The education of every public school is a farrago of rules, principles, and customs derived from every age of teaching, from the most modern to the most remote."

Now the normal school is the child of the reformers. It is expected to make new paths, to defend new truths; and, in doing this, it must face the opposition of conservatives. But, as normal schools have gained standing, and their teachers have been paid good salaries, the tendency has been to receive men as teachers who have no loyalty to any normal-school doctrines except that teachers should be well paid.

The result in this case has been that normal schools have lost their freshness and vigor. Books are studied instead of things and laws, words are recited, but no ideas or judgment expressed. Pupils may become scholars, but not teachers. An ambition may be fostered to learn a science or practise an art, but not to teach school; in truth, the school falls into the common rank of academies and high schools.

A second gravitating influence is the spirit of aristocratic exclusiveness.

Every man finds it in his nature to associate with his equals or his betters, in preference to those beneath him, either in station or intelligence. So in education, schools had long been open to the wealthy and noble, and universities, as at Prague, Oxford, and Paris, were crowded with students long before Christian philanthropy moved teachers to serve the masses, or to study how children should be taught. In the history of normal schools this disposition can be reckoned as a constant quantity. They will show a continual tendency to ally themselves with higher education and neglect the elementary; they will aspire to a good name for the higher academic, rather than to the self-sacrificing work of promoting primary instruction by better methods and more thoroughly trained teachers.

I name these as diverting tendencies, which go far in accounting for the irregular development of normal schools and the questionable position they still hold in the educational system.

With this prefatory review, I proceed to show the true place and character of normal schools as indicated by the demands of the civilization that called them forth.

The first demand is of that which is known as "The New Education."

When training demanded development of powers, mental, moral, and physical, by which the pupil might sustain an independent relation to the world, gaining ideas by his own observation and forming judgments by his own reason, then it appeared that teaching is a high art, that a scholar is not necessarily a teacher, that learning symbols of ideas or judgments does advocate and is representative of the new education. Its chief end must be to make teachers practically familiar with the laws of the mind, the order in which its faculties develop and mature, the best practical methods of directing these growing energies in observation, memory, imagination, language, and reason, together with giving them such practice under criticism as will enable them to execute according to their theory. Of course this is only reaffirming what has come to sound almost trite, — that normal schools must be characterized by their professional work.

I have known so-called normal-school men who have defended the academic character of their schools and the quite entire absence of professional work on the plea that we learn best how to teach by being well taught; that is to say, that normal schools have no distinctive work separate from that of all good schools, or that no good teaching is done outside of normal schools, these having been established to furnish the world a proper standard, — an assumption both gratuitous and offensive.

Again, very immediately related, is the responsibility of normal schools in elementary instruction. But while learned doctors were leading thought in the great universities, and doing great things with great subjects, philanthropists, as Rousseau, Comenius, Pestalozzi, and Froebel, gave their best thought to the children, and in reward have gained names that will be held in honor as long as the children have friends.

And now as to the character of the professional work, there are two well defined departments. In the first, normal schools should train philosophic teachers, — teachers with that masterly comprehension of the entire field that will enable them and dispose them to make new and safe paths, and be ever fresh and inventive. This department is by all means of the highest importance, and never to be lost sight of. Yet, taking a practical view of the demand, it is

just as evident that for the leader there must be many followers, that the thought and invention of the few may be appropriated and applied by the many who think and labor within a more contracted horizon.

Now *both* departments of this work must be provided for by the normal schools. They must sustain this twofold relation to the profession. They should be allied to the university and radiate their influence from a centre ; but no less should they be near the people, and be practical in detailing work for the rank and file. To exclude the first is to hazard all culture and improvement, and to threaten the profession with the mechanical routine of a superficial mediocrity. To neglect the second is to leave the masses uncared for.

Second, but normal schools have a still more important relation to the system, and a responsibility which, I fear, has not been fully appreciated.

At the very time when educational methods took a new departure, when the education of the children was conceded to be the important and difficult problem, the doctrine of popular education was propounded by the philanthropist, and has now become thoroughly established.

But between doctrine and the realization of doctrine in life there is a great interval, as great as between the ideal and the real. It has entered the creed of every political party that the state ought to make provision for the education of all its children. Yet, after these two hundred years of discussion and advancement, four fifths of the children are not included in any well-organized system of continuous instruction by well-qualified teachers, selected upon the generally accepted principles of civil-service reform.

Here, then, is a field for work, — pioneer work, missionary work, — demanding men of enthusiasm to reach down, or, better still, to come down, in their sympathies to the plane of the people, and with patience to show them the advantages of education and the methods of securing it. Now, in this field, the normal school ought to have a place. It ought to be the school of the prophets, the fountain and nursery of the enthusiasm that shall establish the profession and make it a power in perfecting the entire system of education.

Teaching, like the Christian ministry, belongs to the department of philanthropy. While each has a business side, mere considerations of gain, comparing them with other departments of labor, could not induce talent and learning to undertake either. Hence, the men who serve for money, who see no more in the profession than money pays for, and render only the service paid for, are of but little account in times like these.

It is the peculiar province of the normal schools and the highest department of their professional work to inspire teachers with some adequate appreciation of the importance and honor of their service. They do well in supplying the demand for the graded schools, who are doubtless more appreciative; but they lose a great opportunity in withdrawing so far from the common schools of the masses, to whom they are closely allied, and to whom they are so immediately responsible. The penalty will be a loss of professional patronage and material support, and the loss of a great opportunity.

To illustrate with a little history that came under my own observation, and in which it was my fortune to bear a small part.

The State of Minnesota has for about twenty years supported three normal schools. Some years ago, whether justly or unjustly need not be said, the opinion prevailed among the people that these schools were local in their usefulness, and too select for the companionship of the people. The country district which sent its promising young schoolmistress to the normal school for better preparation, declared that she had been educated *away from* them instead of *for* them, that she returned with the feeling that to teach a country school would be humiliating to herself, and at least not an honor to the school that graduated her.

Moreover, the apparent exclusiveness of the teachers of normal schools gave the impression that they were impracticable and visionary. They were as carpet knights, or as brave soldiers who knew not the smell of powder.

So the feeling grew; county superintendents became either indifferent, or they joined the opposition. Legislators reflected the wish of the people, until in an evil day, when the tide of granger influence set in, we were brought to judgment; in a word, our supplies were cut off.

It was to little purpose that we plead our own innocence and the ignorance of the people. The simple fact was that of 180,000 children, the representatives of 140,000 in the ungraded country schools decided that we had not made apparent to them that we were worth supporting. We took the only wise course. We got a new and probationary lease of existence, and began in earnest to define our position and adjust our relations.

The normal schools shared in the institute work, appointing a practical institute teacher for each of their schools. Normal teachers taught in county institutes, became personally acquainted with country teachers, explained and illustrated before their very eyes that normal teaching was natural and common-sense teaching, and

included all the good features of old ways and some features both new and sensible. We principals got out of our soft places and, with gripsack in hand, started upon an educational campaign among our constituents. We stumped the State. In brief, we undertook to ally the normal schools in sympathy and work with the people, to study the wants of the rural schools, and to do our full share in removing the obstacles to progress.

The result has been that these schools are now firmly established in the confidence of the people. In material support and in patronage their "cup runneth over." And I will venture to say, if I may do it without immodesty, that the normal schools of no State are better sustained by the county superintendents, or send to the country districts a larger percentage of trained teachers, than the State I have named.

In summary, then, normal schools are an organic part of the modern system of popular education for the perfection of all its departments. They are the coadjutors of the district officer, county superintendent, and State superintendent. They are established as a signal service in every quarter of the educational horizon, to report currents and give warning of dangers. They are the pledged enemy of every educational heresy in government or instruction, the advocate and friend of honest work.

The university professor may have his chair, and from it satisfy a well-established demand ; but the normal-school professor must live in his saddle in the field and on the march.

Finally, the demand laid upon normal schools is that they comprehend the best scholarship, the most advanced thought upon the philosophy of teaching, with not only the history of pedagogics of the past, but its problems of the present in process of solution, aggressive and loyal to the best interests of the people.

FOREIGN.

GREAT BRITAIN. — *England.—Elementary Education.* — The London School Board has attracted more attention than any other in England, partly by reason of the magnitnde of its work and partly through its regular system of reports. It is, however, generally conceded that London is behind the great towns of the north of England in the development of its schools. Birmingham, Manchester, Sheffield, Liverpool, and Bradford stand out as leaders of progress. Jan. 15th, Birmingham celebrated the opening of a new Board School. The building contains a central hall and eleven class-rooms, having been constructed in accordance with the idea now boldly maintained in Birmingham, that the class system with adult teachers is the only one which promises satisfaction. The school will accommodate 870 children; viz. 300 boys, 240 girls, and 330 infants. A science lecture-room, with capacity for 68 children is erected upon the same site, but its use is not limited to the pupils of the new school. Mr. Mundella's addresses at Birmingham, one delivered in the morning at the opening of the school, the other in the evening before a public meeting in the Town-hall, have attracted great attention. He indorsed the class-room scheme as economy in the time, strength, energy, and temper of the teachers and in the efforts of the children, though financially a little more expensive than the prevailing system. With reference to the Compulsion Act, he said compulsion was not due to the middle classes or to the magistrates, but to the working classes. Opposition, he affirmed, came from the employer, the magistrate, and the rate-payer, and not from the parent. Mr. Mundella called attention to the fact that the average attendance upon elementary schools had risen from 1,152,000 in 1870, to 3,015,000 in 1882; and that the numbers presented for examination showed an increase of 4.11 per cent. in the lower standards, and of nearly 12 per cent. in the upper standards.

Technical Education.—The annual report of the City and Guilds of London Institute has given rise to much discussion of the ways and means of technical education. The leading authorities in England and upon the Continent seem to be agreed in the opinion that theoretical instruction alone is of little value to workmen. They require to see the theory applied to actual work in material, and to practice that application themselves. A number of able and public-spirited London artisans have formed an association for the twofold purpose of making known to the Royal Commissioners, the City and Guilds Institute, and other public bodies, the views and wants of working-men in regard to this subject, and of promoting the formation of technical classes in the neighborhood of the workmen's homes.

Elementary schools, in which the skill of practical and scientific workmen shall be brought to bear upon the training of the young are strongly advocated. In Manchester the experiment of introducing manual training into the elementary schools is on trial. A very cautious feeler in this direction has been thrown out by the London School Board in the form of a resolution asking the Education Department to authorize the introduction of trade-teaching in certain Board Schools.

IRELAND.—*Elementary Education.*—Under the firm, judicious management of the Board of seven commissioners, the national system of primary education is making sure progress in Ireland. Inspection is conducted as in England and Wales. The inspectors are appointed, upon examination, at an initial salary of £250, rising to £500. The requirements of the Results Code in British Schools are almost identical with those enforced by the Irish Board. The latest statistics place Ireland in a favorable position as regards the three essential subjects, the percentage of passes being as follows: Reading, 92.4; Writing, 94.5; Arithmetic, 76.2. In 1881, the National Schools numbered 7,648, with an enrollment of 1,066,289; the grant reached the sum of £729,868. The per cent. of average attendance is low, as is generally the case in agricultural countries. The problem of industrial training is assuming great importance in Ireland. The members of the Royal Commission have visited Ireland for the purpose of determining in what way instruction in the use of tools and in domestic trades may be introduced among the poor people, especially of the western districts; and a memorial has been addressed to Mr. Gladstone, requesting the appointment of a special commission on Irish industries. The memorial is signed by a large number of Irish members,—Liberals, Conservatives, and Home Rulers alike.

UNIVERSITY ITEMS.—*Cambridge.*—Cavendish College, Cambridge, was founded to enable students younger than ordinary undergraduates to pass through a University course, and to train for their profession stu dents who propose to become schoolmasters. The Senate of the University has recently passed a grace admitting the college to an independent position within the University, under the title of "Cavendish College Public Hostel." The success of the students in gaining honors has contributed greatly to the result, while the distinction won by the college boat, and by its cricket and football teams have not been ignored in summing up its merits. The charges at Cavendish are as low as £84 per annum.

Edinburgh.—The Scottish Universities differ essentially from Oxford and Cambridge. Compared with the latter, they are inexpensive, while a large proportion of their students are only fitted for such work as is done by secondary schools in England. In Scotland there is no university life; men lodge as they please, and obtain tuition only at the University. It is noticeable that new English universities incline to the Scottish type. The

medical school of Edinburgh has recently regained its old prestige. The register numbers 1,730 students, of whom only 692 are Scotch. The new university buildings contain the most ample appliances in the shape of museums and laboratories for the study of every branch of natural science bearing upon medicine. The fame of extra academical lecturers attracts many students, and the university pursues the liberal policy of allowing attendance upon them to count in the courses required for graduation.

The Royal University of Ireland.—This university marks an era in the history of education in Ireland. It was chartered in 1880, with power to confer all such degrees as can be conferred by any other university in the United Kingdom, degrees in theology excepted. No residence in any college, nor attendance at lectures in the University, is obligatory, except for medicine and surgery. Thus, the University removes the disabilities from which the Roman Catholic youth of Ireland have suffered. The first act of conferring degrees by the Royal University took place Nov. 8, 1882, in the permanent buildings, Earlsfort terrace. The large assembly included various creeds and denominations, and the ceremonies left a lasting impression of the harmonizing mission of the University. Ladies are admitted to all the privileges of the University, and the names of several appear among the candidates who have attained high honors in Latin and mathematics.

FRANCE.—*Neutrality in the French Schools.*—Education has been a prominent theme in the French Assembly during the present session. In the Senate, a heated discussion upon the question of the religious neutrality of the schools took place, Nov. 18, in which it was claimed that the utterance of certain officials raised the suspicion that neutrality was only a name, under cover of which atheistic doctrines would be inculcated. Mr. Fournier, a senator of the Right, called upon Minister Devaux to define his position on the subject. The response of the minister seemed to give general satisfaction. Among other things he said: "The first duty of the legislature which institutes the schools, of the minister of the government which executes the law, is to assure the neutrality of the schools in a manner the most scrupulous and positive." And again, "The surest means of penetrating every mind with the idea of neutrality is by setting an example of respect for the opinions of all."

The Example of the United States.—Discussion upon the project of law, relative to a general fund for lycées, colleges, and primary schools, took place Dec. 22. The jurisdiction of the State over the communes was considered, members of the Right opposing the doctrine of centralization. "You speak often," said a member, "of the American Republic. You speak of it very often, but never imitate it. Obligatory instruction in America differs entirely from that which you attempt to establish in France. Instruction there is free, in the sense that the States, the cities, have the right to direct it as they desire."

Budget for Primary Education, as passed by the Chamber of Deputies.—For inspection of primary schools, 2,265,297 francs (about $430,000). This article excited lively discussion, the members of the Right insisting that the system of inspection made the schools the instruments of a political party. One speaker exclaimed, amid great excitement, "You have demolished one bastile; you have with the débris constructed 40,000 bastiles." The budget for primary normals was reduced 100,000 francs, by the vote to abolish chaplains, and passed at 2,236,200 francs. For the service of primary instruction,—viz., salaries, school-buildings, superior primaries, and subventions to communes,—to enable them to bear the expenses of making instruction gratuitous, 79,620,200 francs. For primary courses for adults, silver medals for retired teachers, etc., 4,615,116 francs. Reconstruction and enlargement of the Sorbonne, 1,400,000 francs. Instruction of Mussulmen, 94,000 francs. Voyages and scientific expeditions in Algiers, 5,000 francs. Total, 90,235,813 francs (about $17,145,000).

Technical Training.—At the instance of Minister Duvaux, preparatory courses of instruction in manual work in the normal schools, and in the superior primaries, have been prepared by Mr. Salicis of the Polytechnic School. Mr. Salicis is qualified for the service, having organized the manual instruction for the school in the rue Tournefort, and having been subsequently deputed by the Minister to study similar institutions in foreign countries. The first trial of the course is to be made in the place formerly occupied by the school Pape-Carpantier in Paris.

WURTEMBERG.—The Bureau of Education has received an interesting statement of the condition of public instruction in Würtemberg, from which the following is compiled:

The University of Tübingen comprises seven faculties, and numbers forty-nine ordinary professors, seven extraordinary professors, eight auxiliary professors, and thirty-six "Privat Docentem." The total of students in the summer semester of 1880 was 1,223.

Under the head of Schools of Agriculture and Sylviculture are classed the Grand Academy of Agriculture and Forestry at Hohenheim, the Veterinary School at Stuttgart, eight secondary schools, and several kinds of schools belonging to the system of primaries, and numbering in all 808. The courses of these various institutions were attended, in 1880, by 16,722 persons.

The Technical Schools are the Polytechnic School and the School of Builders, both at Stuttgart, and 185 industrial schools, of which twenty-eight are for women. The attendance upon the industrial schools in 1880 was 2,197 pupils, of whom 9,280 were under seventeen years of age.

There are two institutions for instruction in the fine arts; viz., the School of Fine Arts, and the Conservatory of Music, both at Stuttgart.

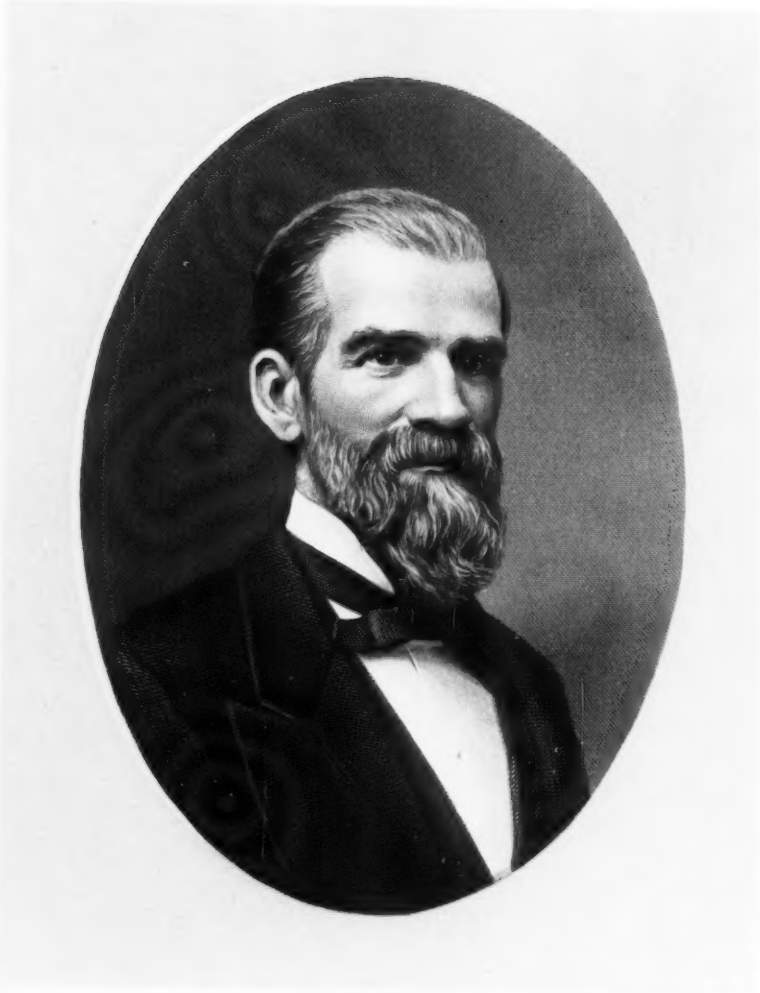
There are 182 secondary schools for young men, and eleven for young women. Of the latter, six are public, and five private; they were attended

in 1880 by 3,305 scholars. There is, in addition to these, a superior normal school for women, intended to prepare teachers for the secondary schools.

The enrollment and attendance of primary schools are not estimated. The number of primary teachers is reported as follows: Protestants, 2,106; Catholics and Jews, 966. Salaries range from 900 to 2,001 marks. The State maintains four Protestant normal schools, and two Catholic for masters, and one Protestant normal school for mistresses. Complaint is made that the preparation of primary teachers is insufficient and their salaries too low. It is asserted that these conditions, combined with ecclesiastical domination, have so degraded the schools as to render them unworthy the title of national.

PRUSSIA.—The statistical bureau of Prussia has just published a work by M. A. Petersilie upon the status of primary schools in Prussia in 1878. In the absence of education reports, this is the latest official information upon the subject. The number of public primary schools, including 110 attached to normal schools, is stated as 33,059, with 60,307 classes. Of the whole number of schools, 23,000 consisted of a single class. The total number of teachers in the primary schools, not including those attached to the normals, was 59,493; to these must be added 27,334 assistants, of whom about 24,000 were special mistresses for needle-work. The total number of children of school-age was 4,272,199.

Of the totals given, 3,915 schools, 20,574 principal teachers, 4,186 assistants, and 1,273,993 children of school-age belong to the cities. A little computation will show that there remain for the rural districts 38,919 principal teachers, and 2,998,206 children of school-age, or 1 teacher to 77 children. The annual expense for primary education, as determined by calculations for the three successive years from 1876–78, inclusive, is for all purposes,—teaching force, school-building, etc.,—101,016,623 marks, or $24,041,956.27. This represents a per capita expense of about 90 cents, estimated upon the populatian as here reported; viz., 26,647,600.



I am Very Truly Yrs.

P. Mallon.